# FOUNDRY TRADE JOURNAL

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WITH WHICH IS INCORPORATED THE IRON AND STEEL TRADES JOURNAL

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OCTOBER 20, 1960

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Offices: John Adam House, John Adam St., London, W.C.2

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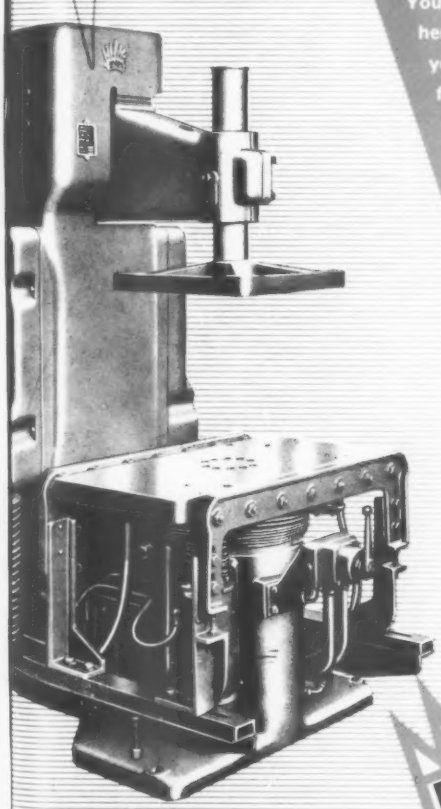
**BQ Automatic**

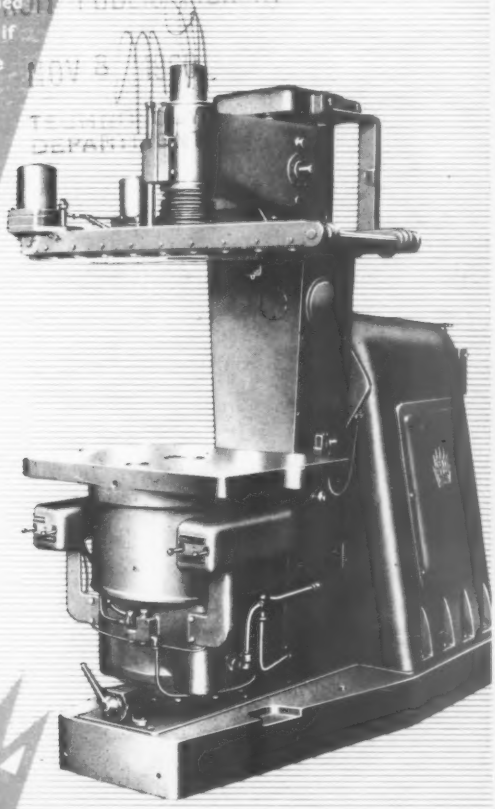
At once the fastest and most versatile automatic moulding machine available anywhere. A range of three sizes with any required method of pattern draw.

We are moulding machine specialists and are currently exporting to 47 different countries. At Weston Works visitors can see machines at all stages of manufacture, from the foundry to the dispatch bay. You will be welcomed here at any time but if you prefer to have full technical information forwarded by post, please telephone or write to us NOW

**BT Turnover**

Automatic jolt turner, automatic draw and automatic mould removal. The finest turnover moulding machine in the world.





BMM

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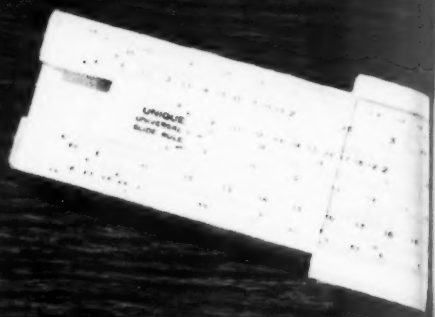

## a constant in foundry formulae everywhere

**CONVENTIONAL COREBINDERS**
*Glyso Core Compounds*
*Permol Core Oils*
*X.L. & Exol Cereal Binders*
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**COLD SETTING BINDERS**
*Corovit*
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BRANDON WAY, WEST BROMWICH, STAFFS.
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# DOT · WELD becomes NON POROUS

The Dot-weld Process has for several years been widely used by foundries throughout the world for reclamation of castings with blowholes and similar defects.

In the past, however, certain castings could not be so repaired because non-porosity could not be guaranteed after repair.

The recent introduction to this country of the MOGUL IMPREGNATING PROCESS now makes it possible to effect a non-porous repair by application of both processes.

**DOT-WELD PROCESS**
*No pre-heating*
*No hard spots*
*No distortion*

**MOGUL IMPREGNATION**
*No baking*
*No cleaning-off*
*No discoloration*

Illustrated above is the Vacuum Pressure Impregnating Unit used for batch processing of medium sized castings (ferrous or non-ferrous). Forty minutes of treatment is followed by a rinse in cold water and 24 hours' drying time. No other processes are involved; no baking or cleaning-off.
The castings show no trace of treatment. FOR USE SEPARATELY OR WITH DOT-WELD.

We are the sole distributors for both the DOT-WELD and MOGUL IMPREGNATING Processes and will be pleased to send you information leaflets on application

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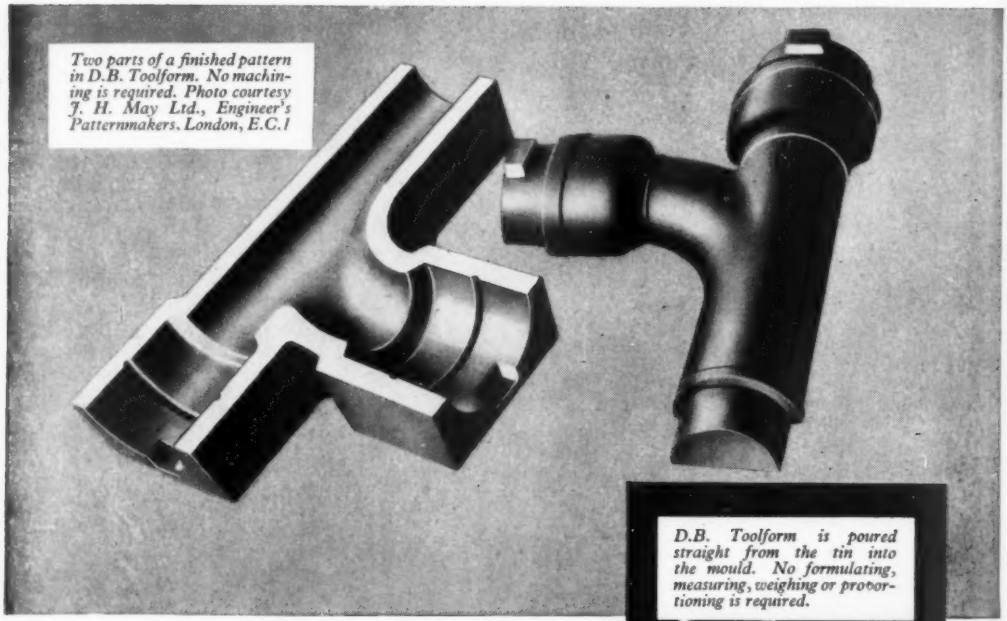

*Two parts of a finished pattern in D.B. Toolform. No machining is required. Photo courtesy J. H. May Ltd., Engineer's Patternmakers, London, E.C.1*

*D.B. Toolform is poured straight from the tin into the mould. No formulating, measuring, weighing or proportioning is required.*

## WITH

# D.B. TOOLFORM

## THE TOUGH EPOXIDE PLASTICS

D.B. Toolform simplifies foundry pattern-making and results in a superior job at an economical cost.

**HERE ARE SOME OF THE ADVANTAGES**

Better abrasion resistance than aluminium • Does not sweat • Patterns can be modified easily at any time • Damage can be quickly repaired • Large patterns can be of hollow construction • Stable when cured • Unaffected by most liquids • Can be stored in the open • No double shrinkage allowance required • Extremely low cost compared with metal patterns.

double bond db TOOLFORM

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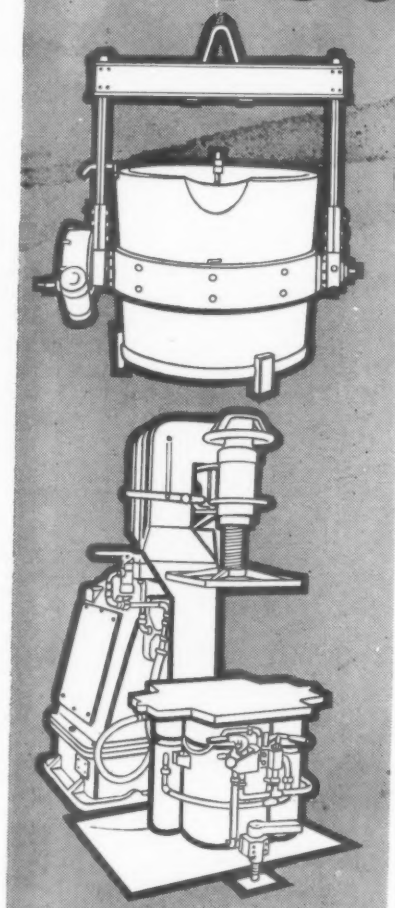
# TWW FOUNDRY PLANT



**The following Selection is available from stock subject to remaining unsold:**

NEW VORTEC STANDARD MODEL CORE SAND MIXER: 56lb. capacity; vee belt driven from 2 H.P. Motor, 400/440/3/50 cycles supply.

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NEW GUYSON SHOT BLAST CABINET, size 42in. by 30in. by 36in.; complete with dust collector and extraction unit wound for 400/440/3/50 cycles supply.

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COLEMAN WALLWORK TYPE CN JOLT SQUEEZE RAM PATTERN DRAW MOULDING MACHINE, load 600lb.; pattern draw 10in.; suitable for boxes 20in. by 20in. or 25in. by 12in.

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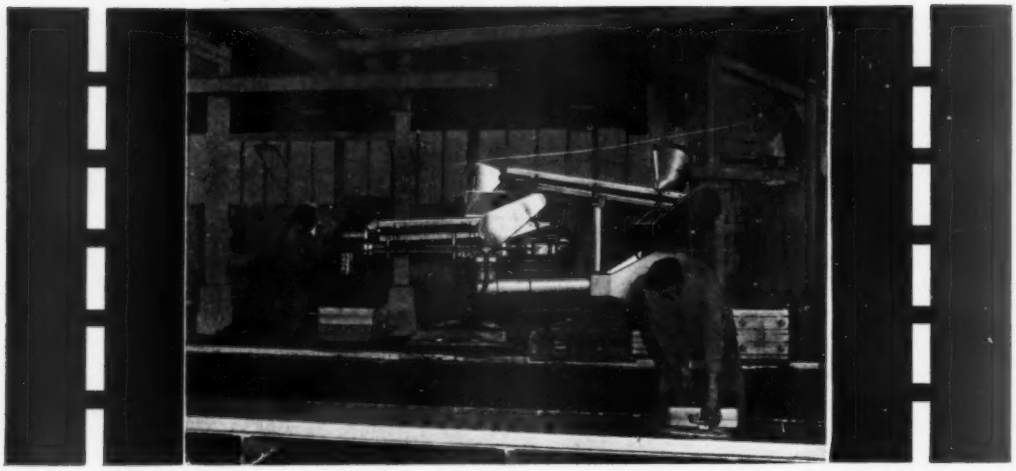

*The above photograph, appearing by the kind permission of The Alliance Foundry Co. Ltd., of Luton, Beds., shows one of our Sand Projection Machines No. 6, which has been installed and is now operating in their Foundry.*

It is indeed a recommendation for our machines that this particular Foundry, one of the most modern and progressive in Southern England, catering for medium sized grey iron castings, should have selected our S.P.M. Machine to replace their previous sand ramming unit.

**Why not follow their lead!**

*Send for details, or, for one of our technical representatives if you wish to discuss the installation of the S.P.M. in your factory.*

**We are at your service—Always.**

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**OUR CUSTOMERS ASSURE US OF THEIR COMPLETE SATISFACTION—**

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*On the other hand we feel we must bring to your attention our facilities for producing both sand and machine cast high quality refined iron. Our scientific approach to customers' specifications ensures we "home on our target" every time, no matter how exacting our customers' requirements.*

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*The Sklenar type 320/500 furnace melts 500 lb. of brass or bronze in 30 minutes; 220 lb. of aluminium in 15 minutes; or 300 lb. of grey iron in 50 minutes.*

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furnaces for general duties in the foundry.

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SKLENAR furnaces melt light alloys, brasses, bronzes, and grey iron in sequence with no risk of contamination.

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SKLENAR furnaces give quick melts (500 lb. brass in 35 minutes) with low metal losses (maximum under 2 per cent.). Finger-tip control of atmosphere for melting non-ferrous metals is standard.

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SKLENAR oil or gas fired furnaces save fuel (0·008 gallon of fuel oil or 4 cubic feet of gas per lb. of metal are typical). No crucibles to renew—no spares to worry about.

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BETTER MELTING WITHOUT CRUCIBLES

1960

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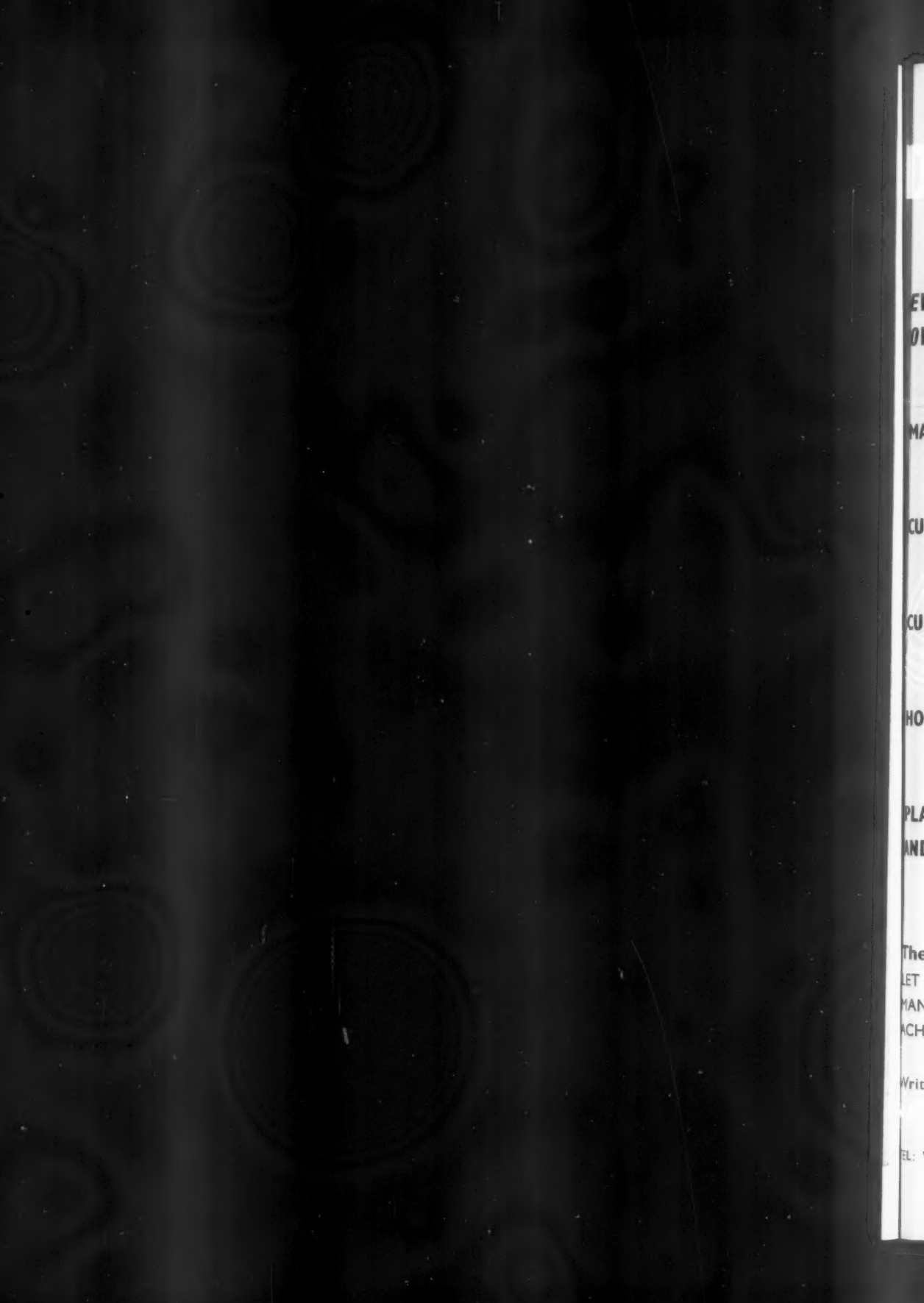

## EVERY FOUNDRY HAS ITS OWN PROBLEMS

MATERIALS HANDLING ?

CUPOLA CHARGING ?

CUPOLA CAPACITY ?

HOT METAL RECEIVER ?

PLANT MECHANISATION AND LAYOUT ?

*Photo by kind permission of Messrs. G.K.N. (Cwmbran) Ltd.*

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LET US PUT YOUR SCHEME ON PAPER AND DESIGN, MANUFACTURE AND ERECT THE CORRECT PLANT TO ACHIEVE YOUR PARTICULAR REQUIREMENTS.

METAQUIP

Write or Phone:

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A3

# *Another Perfect Strip*

## Using "DURRANS" No. 10 Prepared Blacking

*130 ton Ingot Mould is re-produced by kind permission of The Brightside Foundry & Engineering Co. Ltd.*

**STEELMOL** *for STEEL and SPECIAL IRON CASTINGS*

**HIGH CARBON BLACKING · CEYLON PLUMBAGO**
**TERRA FLAKE · COAL DUST · GANISTER AND**
**"ALUMISH" FOR ALUMINIUM Non-Silica PARTING POWDER**

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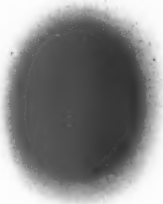
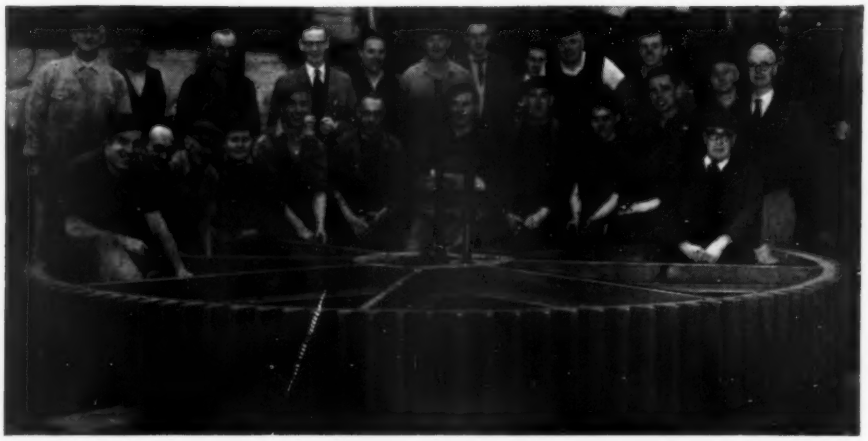
a
burning
problem



solved
overleaf

SHELL



A poorly finished casting, rough and blemished, can lose an order — and a reputation. Protect both. Ensure first-class finish with Foseco inflammable mould and core dressings. They are consistent. They are *not* expensive. They burn smoothly and evenly. They result in best possible finish. And one of the reasons why Foseco 'fired' dressings achieve such consistently good results is that they contain Shell I.P.S. — isopropyl alcohol — the ideal solvent.

This grey iron casting was produced by Bodley Bros. & Co. Ltd. of Exeter. Machined, it weighs 5 tons 6 cwt. Diameter is 12' 6". Teeth are 15 inches wide. Foseco Flamco and Shell I.P.S. were used for dressing the mould and cores. Flamco is the finest graphite dressing in powder form: I.P.S. is top quality isopropyl alcohol.

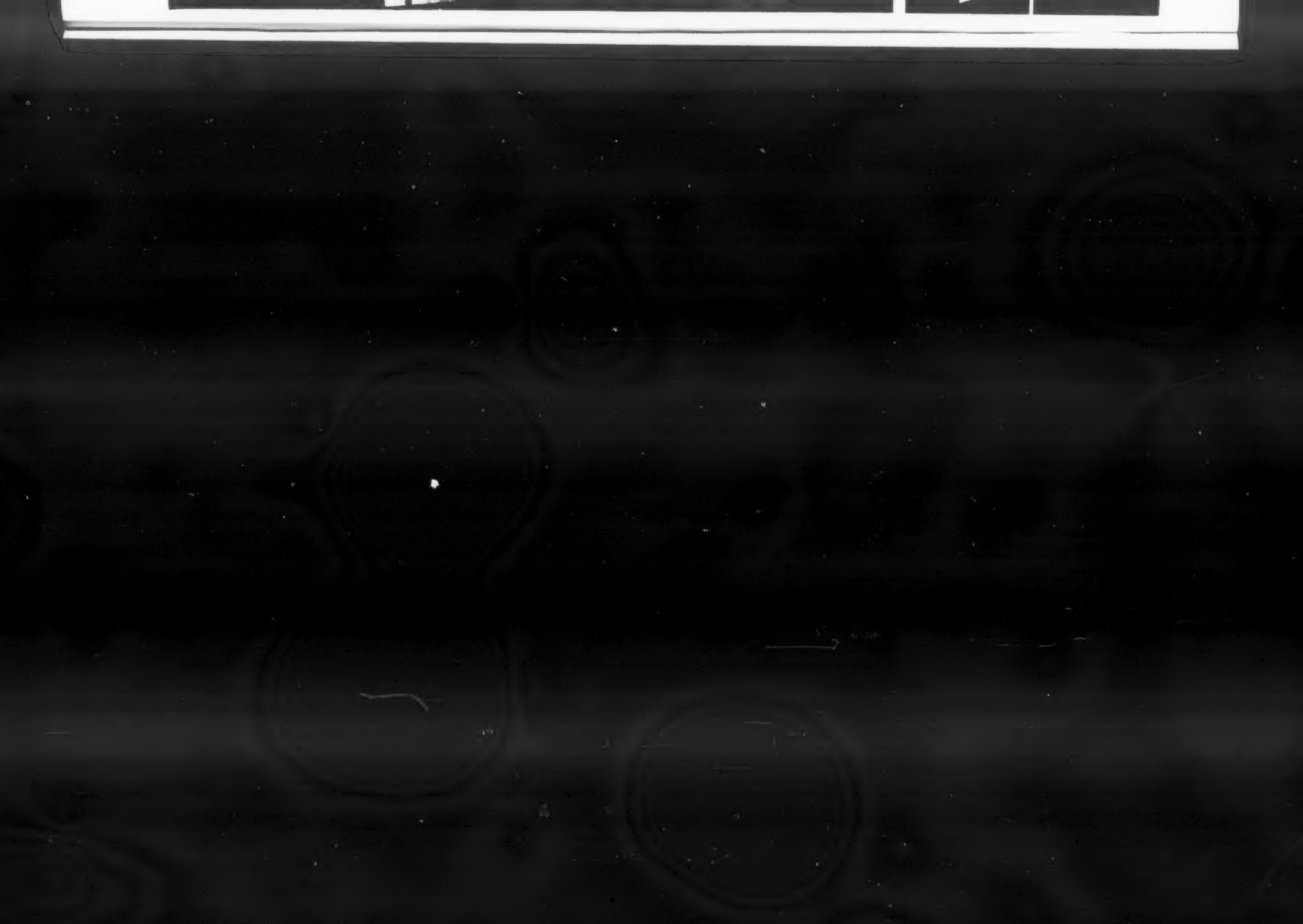
**WORLD-WIDE** SERVICE FOR FOUNDRYMEN

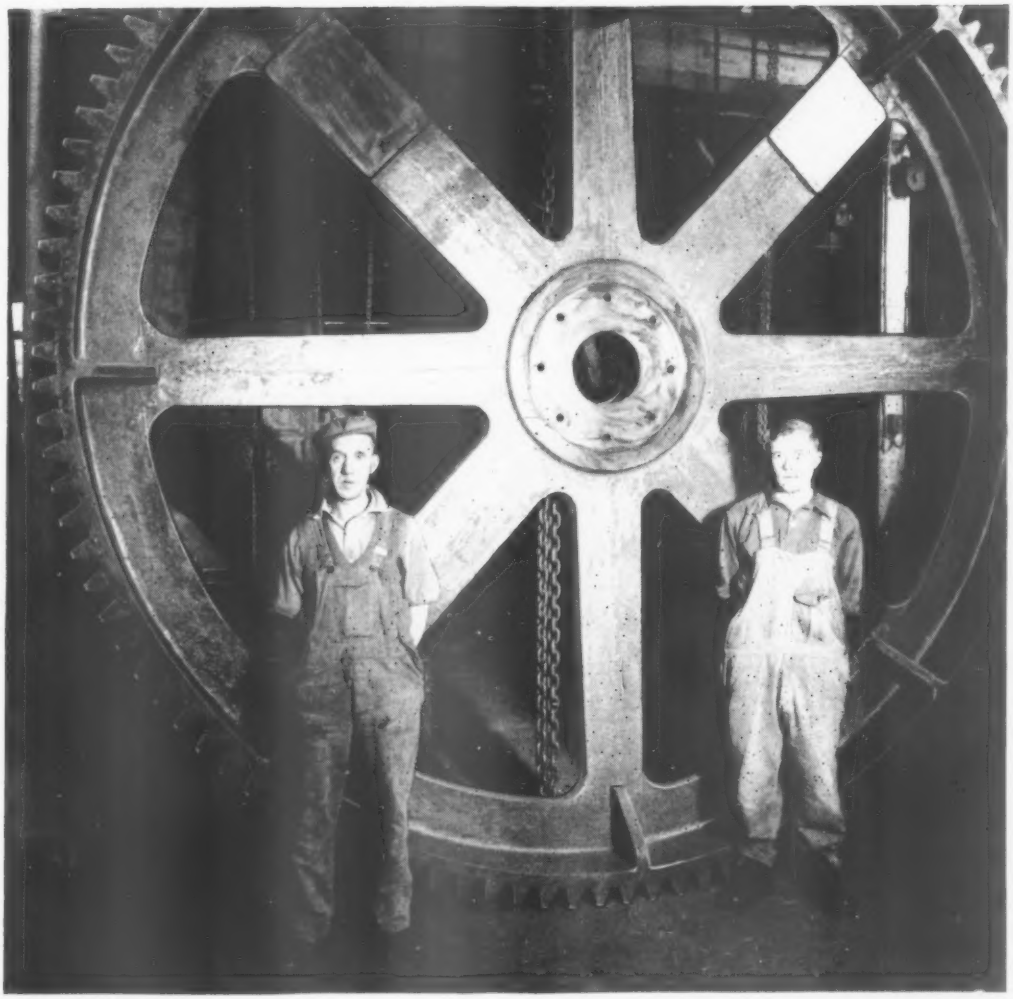
# Foseco

fired dressings with **SHELL I.P.S.**

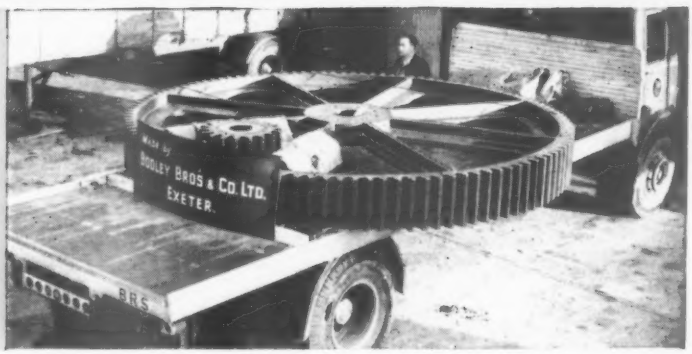
Sole distributors of I.P.S. 1 and I.P.S. 2 to the Foundry Industry in the United Kingdom and Republic of Ireland for Shell Chemical Company Limited.

1960





SHELL



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Two important factors
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Firstly, as a Borolite wheel wears,
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# Here's a NEW Blacking

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# WINNER!

**No 47** is not 'just another Blacking'. It is an entirely new type of Blacking and has been fully approved by some of the largest Foundries in the Country. Foundries making really large moulds in Loam or Dry Sand will find it an exceptional blackwash in every way —no limit to weight and *no* section too thick to produce a perfect strip.
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No 47 – the ACE of BLACKINGS – a *FREE* sample on request.

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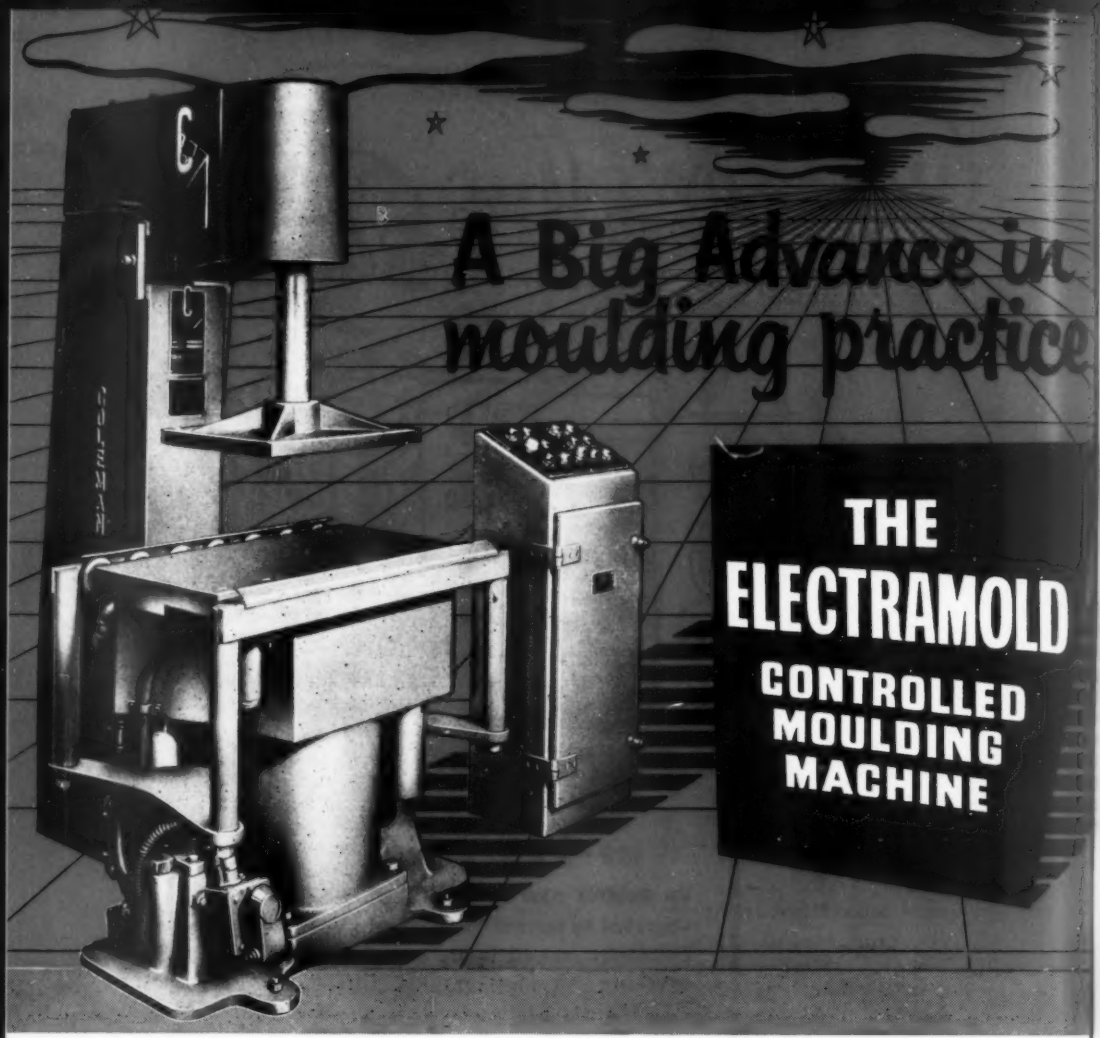


120 moulds per hour all of consistent quality

Compared with the normal hand-operated machine this *electronical* controlled moulding machine has distinct advantages. Each operation of th moulding cycle is performed in the exact, predetermined, optimum tim thus ensuring that all moulds are exact replicas of each other. This lea o a uniform, consistent quality of casting with a minimum of scrap. considerably increased output rate is also ensured, 120 moulds per ho being well within the capacity of an effectively tended unit. *The quick set controls make the ELECTRAMOLD equally suitable for long a short runs.*

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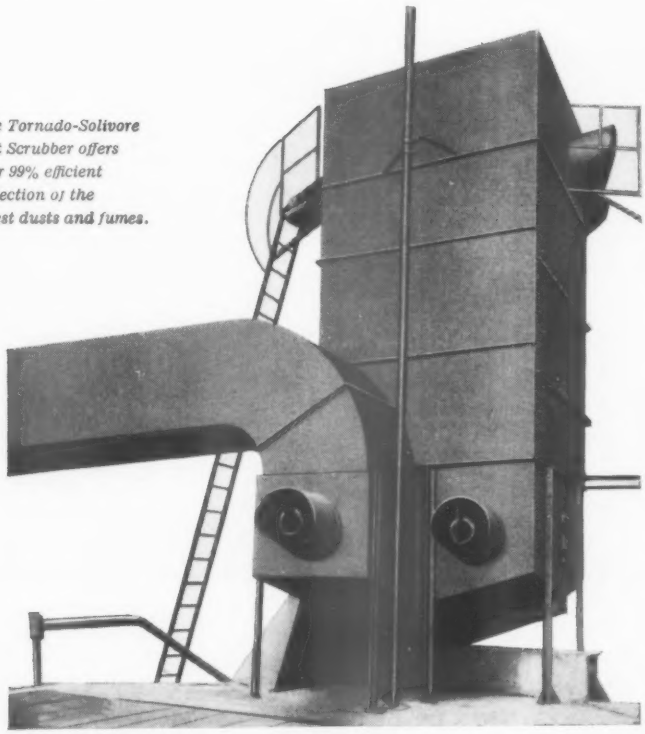
*The Tornado-Solivore Wet Scrubber offers over 99% efficient collection of the finest dusts and fumes.*



when the problem's

# DUST OR FUMES

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For over 60 years, Industry has turned to 'Tornado' to settle dust and fume extraction problems. Keith Blackman were the first in the country to use air extraction as the basis for dust and fume exhaust systems. With this record and this experience they are the natural choice for your problem. You too, should 'turn to Tornado' for advice on *complete plants* or individual equipment. There is a qualified representative in every industrial area.

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PD-KB electro-static precipitators

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Paddle type industrial fans

the difference is in
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FREEDOM FROM IMPURITIES
which are the qualities of

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## Non-ferrous Alloy

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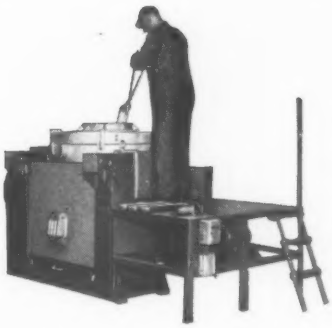
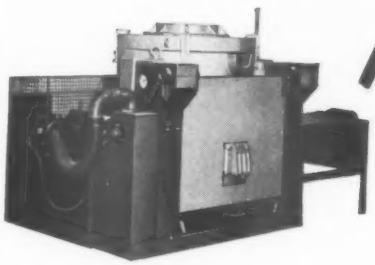
From the table high platform, into the open top basin, with bulky scrap or ingots.





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By supercharge pre-heating, with an unusually high thermal efficiency, and unusually low metal loss.

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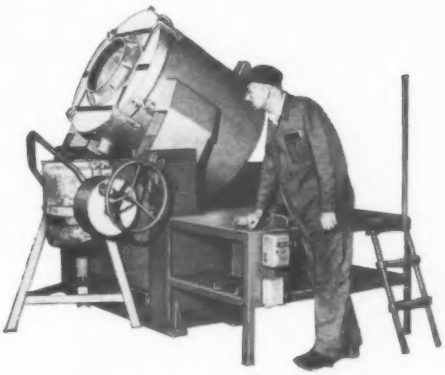
With automatic finger tip control of lip axis pouring enabling transfer ladles to be kept in one position throughout the pour. Metal can also be poured direct into Bale-out furnaces.



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*Oil or Gas-fired*

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2 crucible sizes take 380 lb Al. (1100 lb bronze) or 500 lb Al. (1500 lb bronze); rapid melting without contamination or inclusions, giving minimum rejects; low crucible cost; a high melting rate with fuel costs down to 27/- per ton aluminium, 22/- brass or phosphor bronze.

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gas & oil-fired crucible melting furnaces.

gas, electric and oil-fired annealing furnaces & ovens specifically for foundry use.

shell moulding and mould closing machines.

mould driers
sand driers
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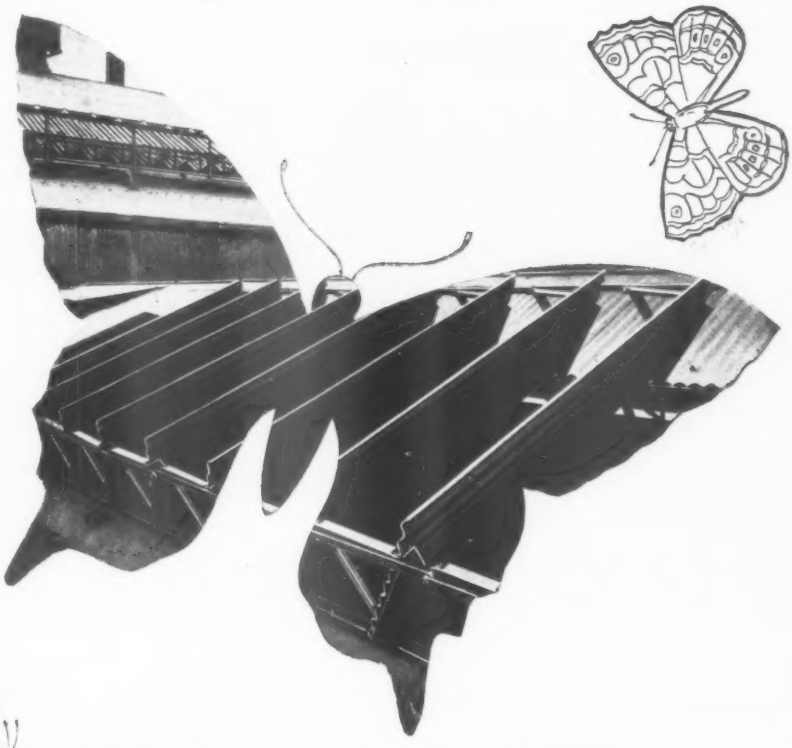

## fine day in the foundry!

Open the way to fresh air — and increased production through better working conditions — by installing Hills industrial ventilators.
At the touch of a button, controlled louvres open wide to the sky, drawing off smoke, fumes, overheated air. Weathertight when closed, adjustable to varying conditions, they can be left partially open even during rain.
In the foundry, retort house, factory — wherever Hills ventilators are fitted — its a clear day every day.
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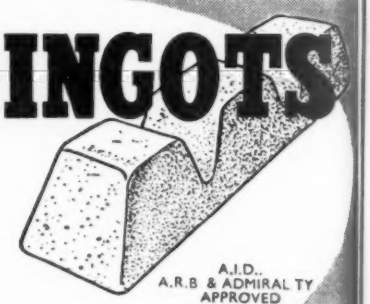

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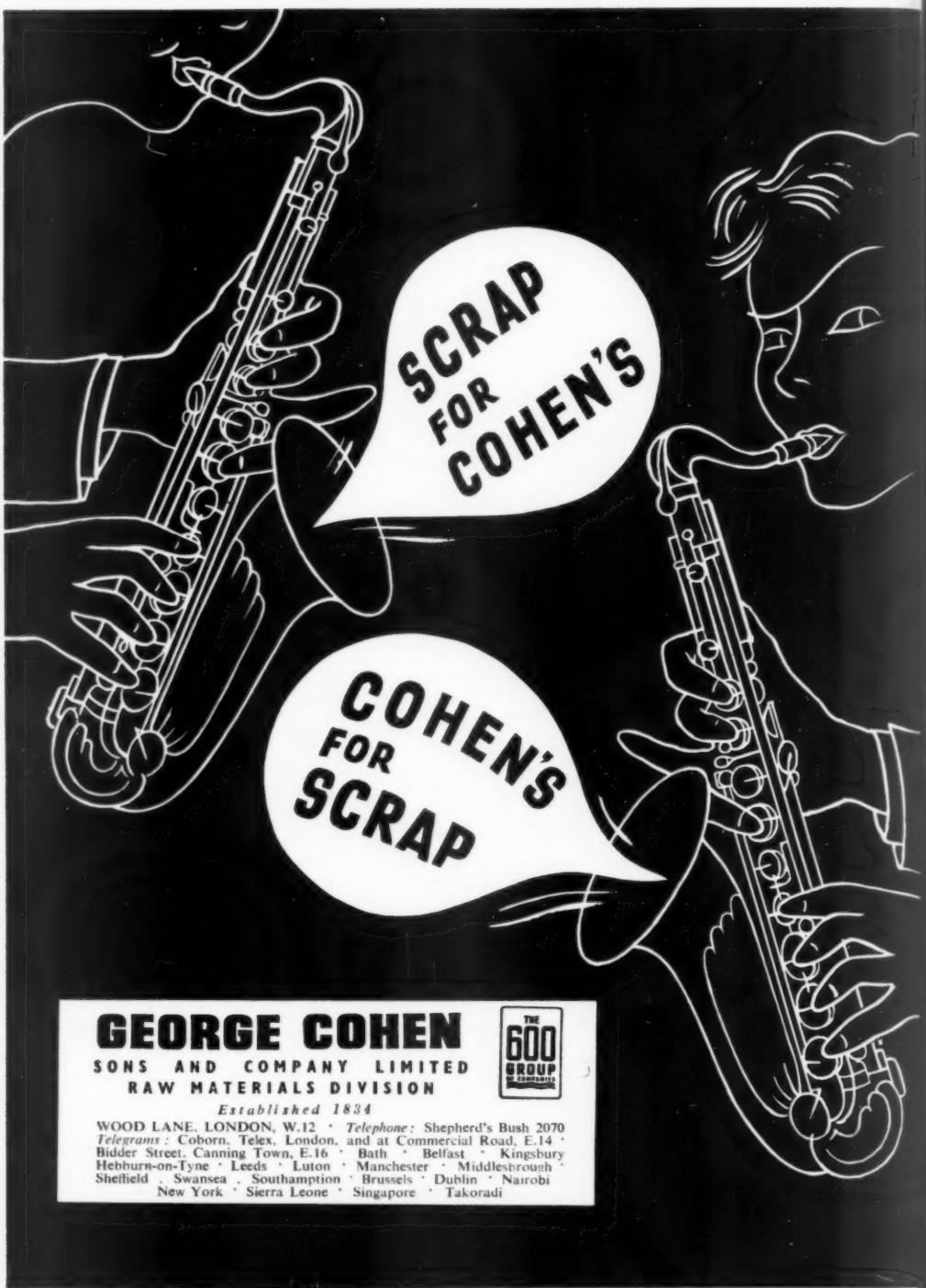


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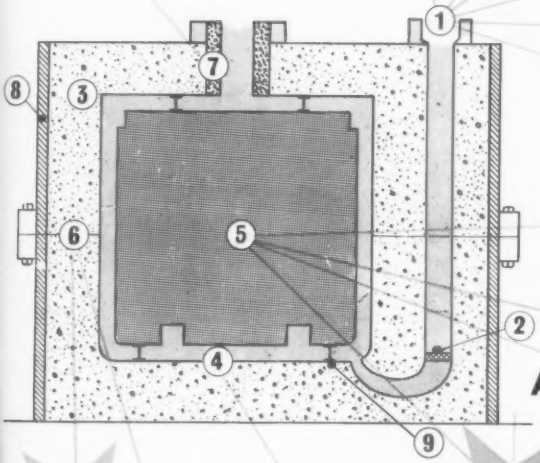


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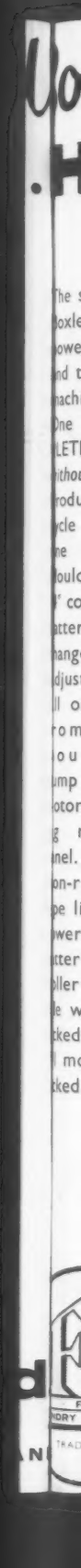

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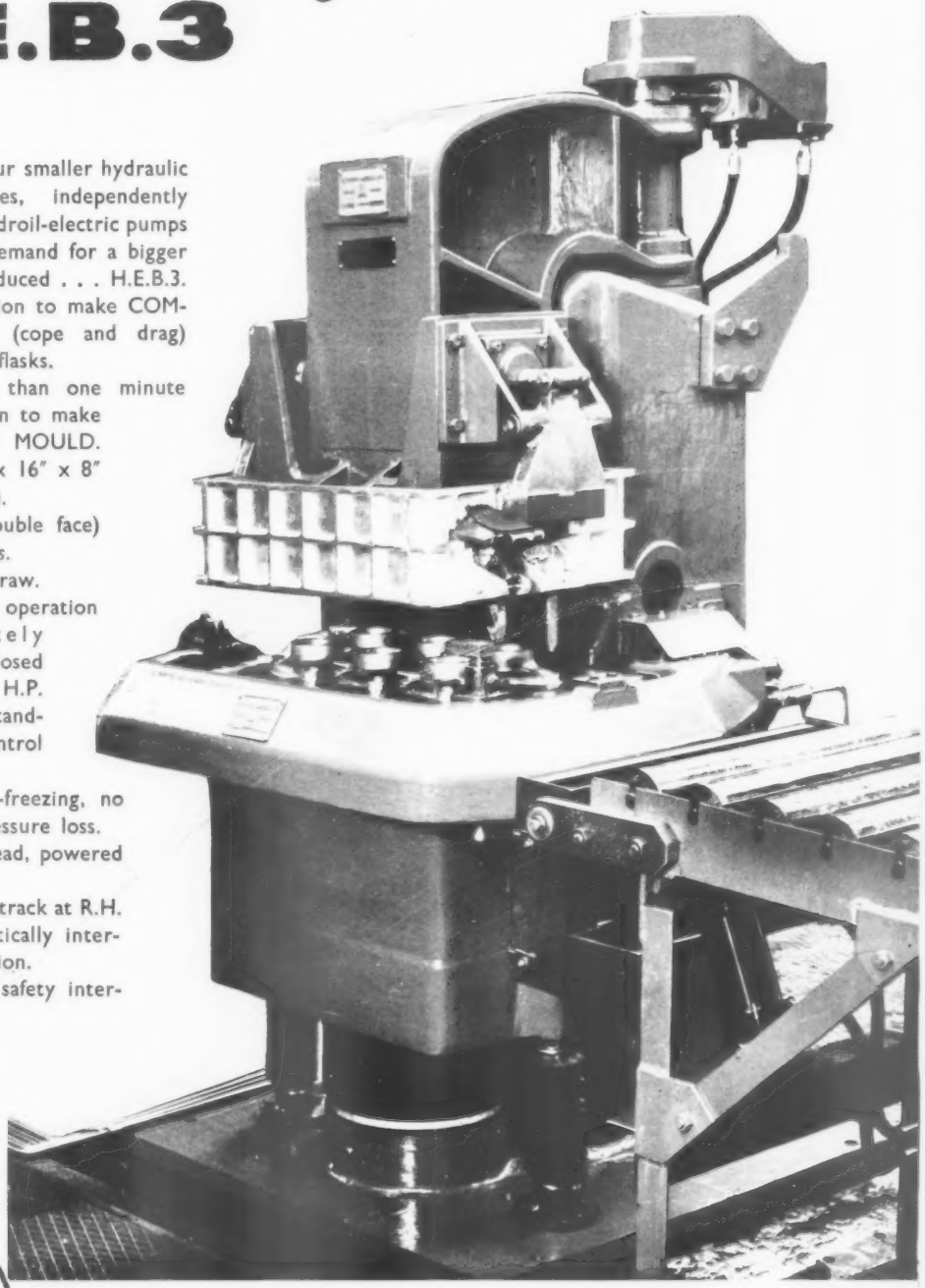

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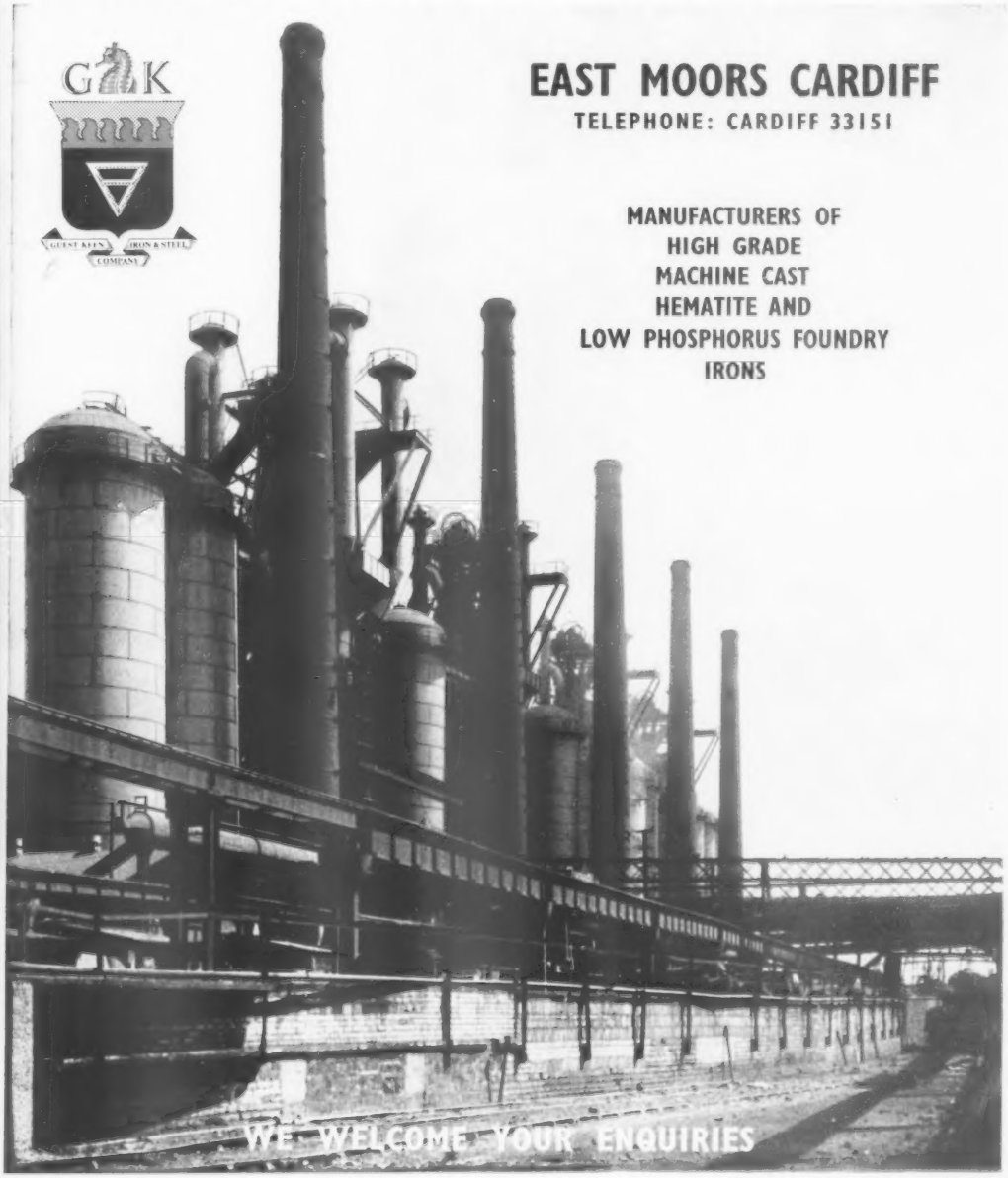


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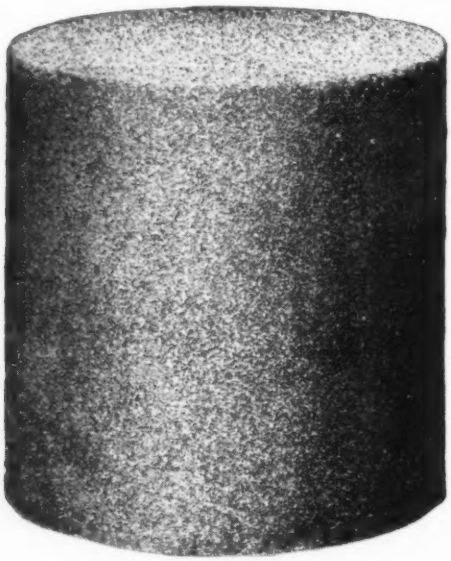

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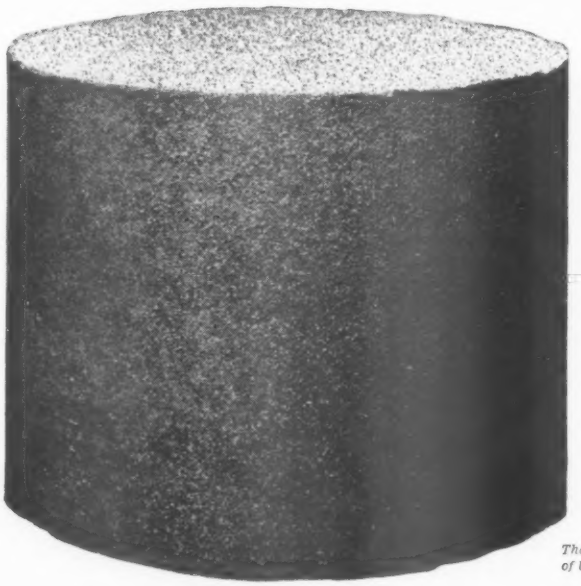

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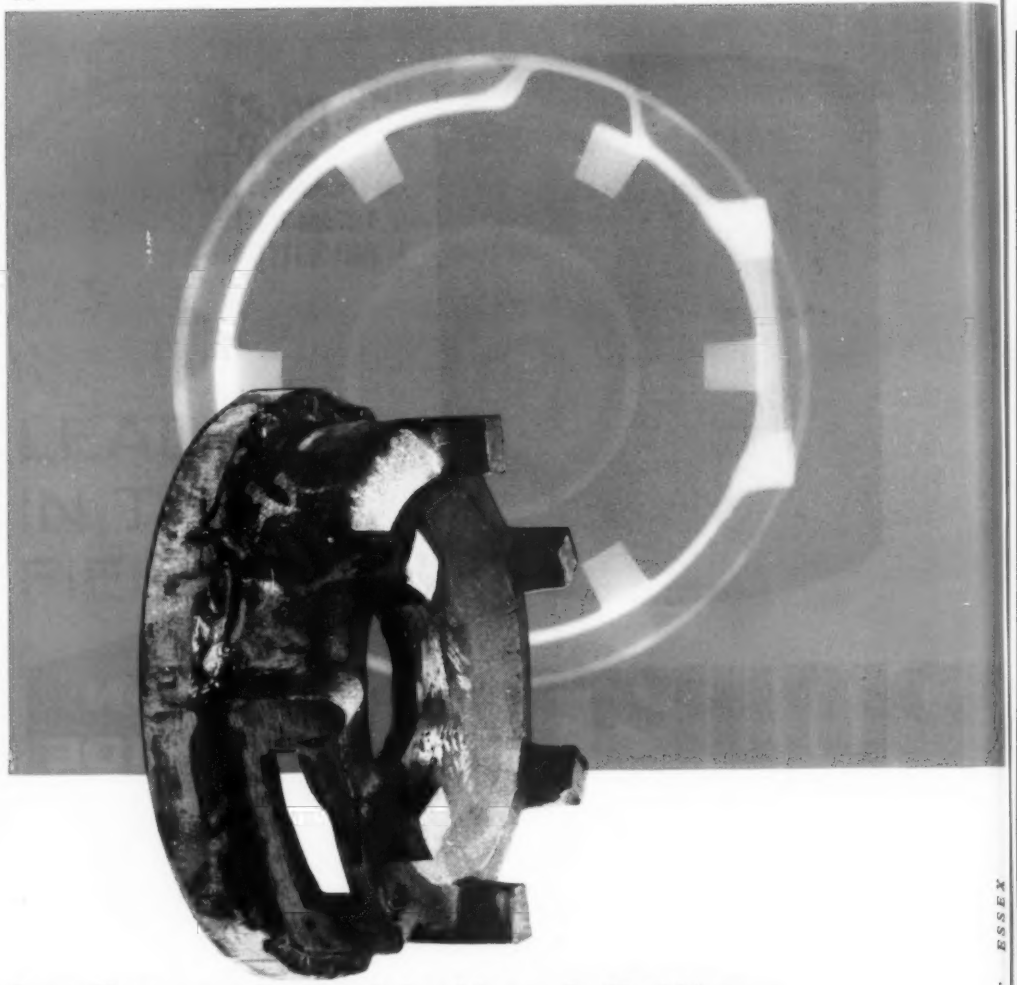

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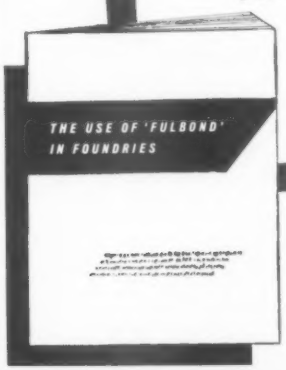


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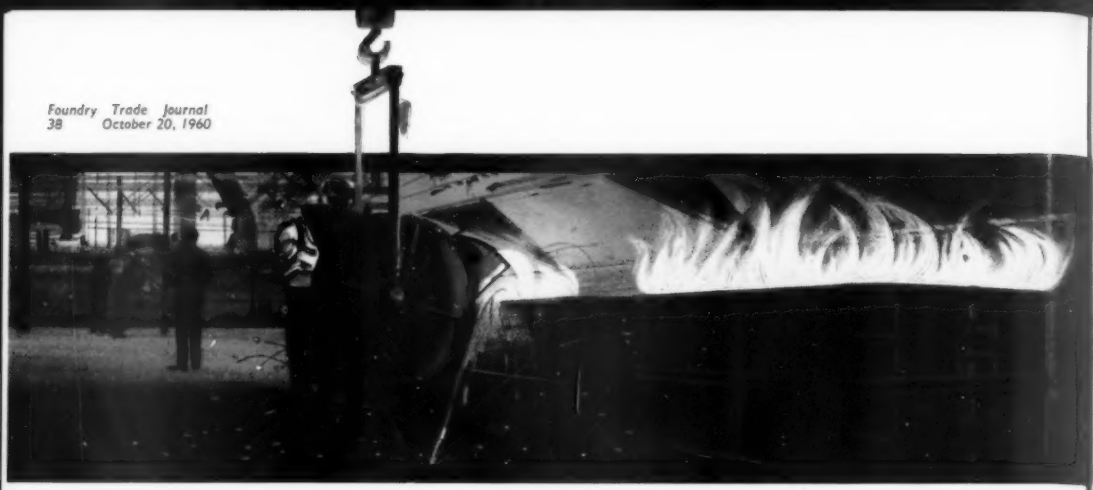

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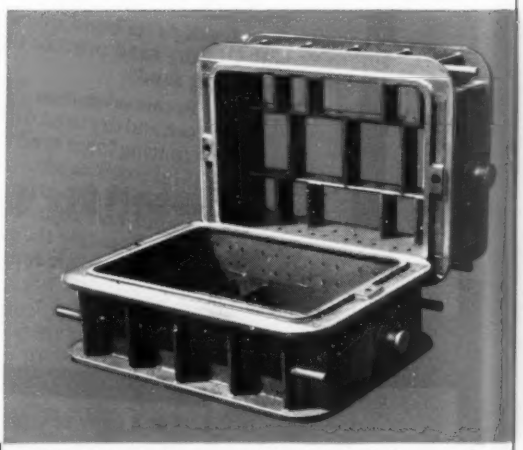

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Vol. 109 October 20, 1960 No. 2289

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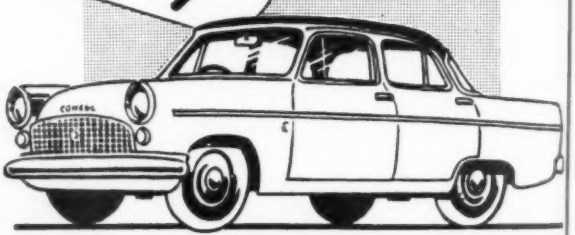

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FOUNDRY
TRADE JOURNAL

Vol. 109 October 20, 1960 No. 2289

# Moving House

It is almost axiomatic to state that one never knows what a house is like until one has lived in it. Yet, by a careful study of the building and the district, risks of disappointment can be minimized. This, too, applies to the re-location of a foundry or the establishment of a branch factory. The subject has been dealt with in general terms by Mr. R. Mathias of the Transport and General Workers Union in a paper he presented to the recent conference of the British Institute of Management, but stress was laid on labour/managerial relations. He introduced a table (printed elsewhere in this issue* of the JOURNAL) which shows the conditions of the major industries in Wales, including the foundry industry. This sort of information does help manufacturers to get into perspective the inter-industrial relationship.

To-day, any proposed removal or extension of a manufacturing concern is conditioned by Governmental advice. The seaside resorts often have special recommendation of the Government, but the incoming manufacturer in such places, especially in the early days, is likely to lose a serious percentage of labour to the catering industry during the holiday season. The new towns often attract the lighter industries and the heavier ones find it difficult to " sell " employment against this competition.

Conditions were different in between the two wars, when municipalities produced information booklets giving everything a prospective client seeking manufacturing premises could possibly wish to know. To-day's appeals are usually based on one factor only—the availability of unskilled labour and, maybe, housing for personnel. One city which formerly sought to attract additional factories inside its boundaries is now busily helping their removal to the periphery or even to quite new locations. To-day, removal of a foundry often involves a measure of remoteness from traditional markets, difficulties in handling export orders, or dislocation of the key staff. Yet firms which have been compelled either partially or wholly to migrate do after a period settle down and even become enthusiastic about the new set-up. We could cite a dozen of such cases and while it would be wrong to state that removals have altered the geographical set-up of the foundry industry, it is truthful to insist that it has been profoundly modified, as statistics will show. The help of those who have experienced removals should be sought—through employers' organizations—by those contemplating such changes.

* Page 506.

# Correspondence

*To the Editor of the* FOUNDRY TRADE JOURNAL.

## "TOO MUCH ABOUT MECHANIZATION"

SIR,—I have read with interest Mr. A. E. Wiles' answer (September 15, page 320) to my criticism on this subject (August 25 issue, page 222). He is right in much of what he says but I think he oversimplifies the question. I do not think we should blame buyers in general in the matter. There have been one or two unscrupulous ones in the past but the repercussions have been such that buyers are now only too anxious to co-operate. After all, a buyer must buy on price and delivery: he cannot be expected to measure quality against price in so complex a process, but must rely on the integrity of his suppliers.

I believe that mechanization is popular because it fits more easily into the modern approach in industry. It can be planned and programmed and assessed by minds trained to this work; and about the process itself there is no mystery. Skilled loose-pattern work, on the other hand, is neglected because it does not fit in so easily for measurement and assessment. I would like to make two points which explain my own concern. I am not in a position to have an overall picture of the industry but my work gives me a fairly representative cross-section of it. I do not think that one third of the total output of the country lends itself to economic mechanization. (Have you any firm figures here, Mr. Editor?)* The second point is that, if a more-scientific and detailed investigation were made into some of the aspects of the skilled side of the trade (as it could be) a tremendous improvement would be felt economically. To mention only two instances very briefly:

*Pricing by Weight*

This has always seemed to me to be a most illogical way to price a casting which had any amount of work embodied in it. It would be more logical (if weight *must* be the standard) to charge more as the weight grew less, seeing that a lot of the skill required is devoted to cutting the weight down! The attractions of pricing by weight are: That it is a convenient "vehicle" for bargaining between buyer and supplier: and that it is a handy peg if the foundries' ideas on the job are rather hazy. It seems obvious that castings requiring skilled attention should be quoted for, and charged, "by the piece" not per lb.

*Quoting from the Drawing*

I am sure that this is where a number of our many smaller foundries fall into error on price; and how it is that an unscrupulous buyer can, by a confidence trick, cut the price too meanly. No one with a sound assessment of the work involved would accept jobs below a working profit margin. To quote from the drawing in this type of work requires a skill in the reading of drawings which is outside the experience of most foundrymen, with the exception of some in the patternshop. I have heard it said many times "Let's get the job, we'll sort it out afterwards"! Have not many foundries made a mistake in closing their own patternshops in favour of farming this work out? My own view is that at least one fully experienced patternmaker is a necessity in any progressive foundry and could be kept fully occupied in this connection. A patternmaker so placed can become a very good foundry technician.

There are other sections of the foundry industry which would benefit by some form of reassessment, *e.g.*, fettling and inspection, to name another two, but to deal with all these things in detail is beyond the scope of an ordinary letter.

Finally, I do not think that many fully skilled men have left the foundry trade, except to retirement. A man of this type finds it very difficult to change what, to him, is his way of life. His temperament and his whole training are against it. Skilled labour is short because fresh blood is not coming into it. This is not to be wondered at. A youth whose intelligence and temperament attracts him to a craft trade usually has a good deal of pride and sense of achievement. He will not take up a trade where the products of his skill seem to have little commercial value and are accepted "on sufferance."

This letter touches only the fringe of the problem; and the points it discusses are put with all due respect to the many able people staffing our foundries; but sometimes the onlooker sees more of the game and it would be deplorable to find the foundry trade degenerate into a minor industry.

Yours etc.,

(Writer's name and address supplied; he is attached to the planning department of a large electrical firm in the Midlands.)

[* Editor's Reply: No definite figures are available in this country as to what proportion of the foundry industry's total output lends itself to production by mechanized means. The correspondent's guess may be a good enough assessment. However, he should bear in mind that the output structure of the industry is such that about 80 per cent. of the tonnage is handled by about one fifth of the total number of foundries and that among that fifth would be found mainly mechanized foundries. This is not to say that on a value basis or in terms of service to industry in general the jobbing foundries are any less important.]

# Forthcoming Events

OCTOBER 24

**Society of Chemical Industry**

*Corrosion group:*—Brains Trust on "Cathodic Protection," with J. S. Gerard, J. H. Morgan, K. A. Spencer and W. G. Waite serving on the panel, 6 p.m., at 14, Belgrave Square, London, S.W.1.

OCTOBER 25

**Institution of Plant Engineers**

*South Wales branch:*—"Thermal Insulation of Factory Buildings," by N. Foster, 7.30 p.m., at the South Wales Engineers' Institute, Park Place, Cardiff.

OCTOBER 26

**Institute of British Foundrymen**

*London branch:*—"Precision in Casting," by A. Short, 7.30 p.m., at the Constitutional Club, Northumberland Avenue.
*Birmingham branch:*—"Some Applications of Work-study in the Foundry," by A. A. Timmins, 7.15 p.m., at the James Watt Memorial Institute, Great Charles Street.

**Manchester Metallurgical Society**

"Metallurgical Aspects in the Development of Fast-fission Reactors," by Professor C. R. Tottle, 6.30 p.m., at the headquarters of the Manchester Literary and Philosophical Society, George Street, Manchester.

**Society of Chemical Industry**

*Corrosion group, Midlands branch:*—"Will it Corrode?" by Dr. U. R. Evans, 7 p.m., at the Engineering Centre, Stephenson Place, Birmingham 2.

OCTOBER 28

**Institution of Plant Engineers**

*Birmingham branch:*—"Industrial Law," by T. W. Wright, 7.30 p.m., at the Imperial Hotel, Temple Street, Birmingham.

**Institute of British Foundrymen**

*Falkirk section:*—"History and Future of a Mechanized Plant," by James H. Andrew, 7.30 p.m., at the Temperance Cafe, Lint Riggs.

# A Foundry without Moulding Boxes

*By J. Steele*

**Wooden frames are used to retain $CO_2$-Process moulds prior to gassing and thereafter the mould halves are sufficiently strong to permit casting-up without the need for moulding boxes. Castings weighing up to 10 cwt. are produced in this way by Springfield Steel Company, Limited, in their Glasgow Foundry**

Springfield Steel Company, Limited, of Bridgeton, Glasgow, E.1, produce 150 tons monthly of alloy- and carbon-steel castings without the use of moulding boxes. This production is carried out in a small moulding bay (Fig. 1) which caters for repetition castings. The Springfield foundry was established in 1880 and evidence of the progressive outlook of its management over the years can be seen when visiting the works. Here, a Bessemer converter and an open-hearth furnace now lie idle, having given way to a 4-ton capacity Efco electric-arc melting furnace with automatic electrode-control. Consideration is at present being given to the installation of electric-induction melting equipment.

### Present-day Layout

Further evidence of the company's progressive outlook is exemplified by the fact that the moulding shop has been converted to the use of the $CO_2$ Process. The practices to be seen to-day are the result of five years of research and development carried out on the premises. Liquid $CO_2$ is stored in a tank of 5-ton capacity and supplied to the moulding station through a receiver and distribution pipes. Silicate is drawn from a bulk storage tank of 20-ton capacity (this unit can be seen at the rear, left, of Fig. 1 with the vertical gas-receiver immediately in front).

Mould and core sands are mixed in a 3-cwt. capacity Jackman batch-type mill, and 50 per cent. new and 50 per cent. reclaimed sand is used as a basic mixture, with an addition of 4 per cent. silicate. A conveyor belt delivers sand from the mill to the storage hoppers located at the

FIG. 1.—*General view of the moulding bay of Springfield Steel Company, Limited, for producing small castings. The bulk storage tank for silicate is shown at the rear, left, of the illustration, with the vertical gas-receiver immediately in front.*

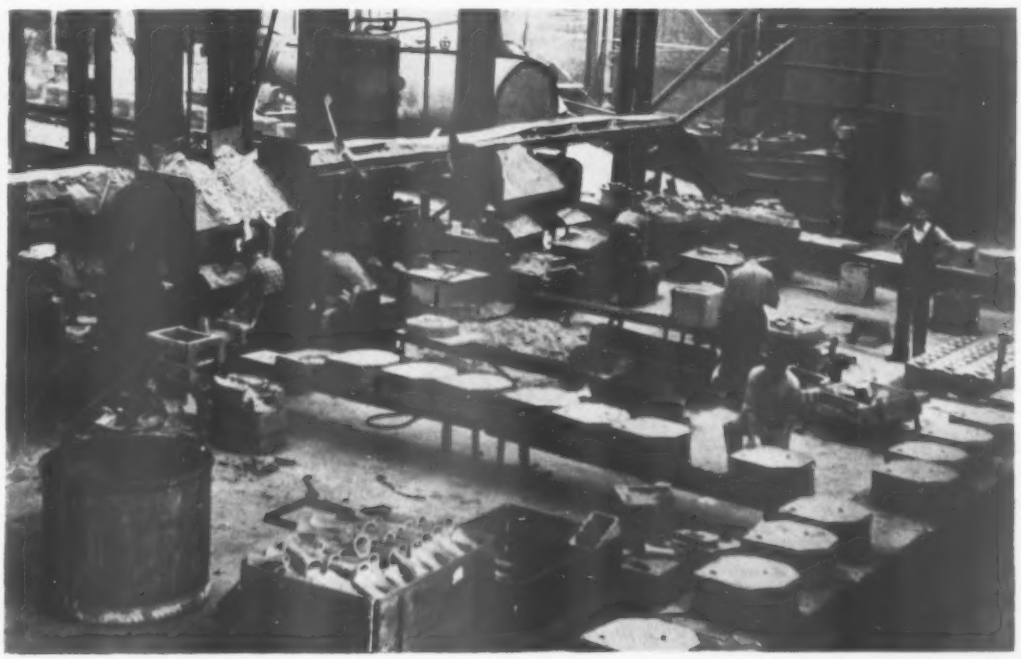

FIG. 2.—*Mould for a casting weighing* 1 *cwt., as produced in a wooden moulding frame.*

moulding station. As stated previously, no moulding boxes are used—all moulds being made in wooden frames "tailor-made" to fit each pattern (Fig. 2). A close check is kept to maintain the most economic sand : metal ratio, this varying from 1½ : 1 to 4 : 1 by weight according, of course, to the design of pattern.

FIG. 3.—*Half mould on the pallet conveyor, prior to being transferred to the mould assembly and casting bay at Springfield Steel Company, Limited.*

### Moulding Method

Patterns mounted on metal plates are used and as the sand is filled into the frame, a vibrator attached to the patternplate compacts the sand, making use of the excellent flowability of the $CO_2$ sand. Carbon-dioxide gas, at a pressure of 5 lb. per sq. in., is blown into the compacted mould through conventional corebox vents set into the pattern face and patternplate. Most of the patterns in use are made to leave their own cores. Registration of the mould-halves is positive, and arranged by means of a spigot extending around the mould-joint. Simultaneous moulding of the cope and the drag halves enables the moulds to be closed and placed on a pallet conveyor for subsequent transfer to the casting bay (Fig. 3). Cast moulds are conveyed on the same system to the shakeout, which only employs sufficient vibration to remove the bulk of the mould without disturbing the burnt sand adhering to the casting. No mould wash is used on moulds from the production bay, but it is stated that the sand comes away quite cleanly from the casting and no difficulty is experienced because of inadequate collapsibility. Reinforcement is used only for large moulds; those illustrated do not contain any strengthening devices.

### Sand Plant

Used sand is conveyed from the shakeout on an inclined belt to a "home-made" sand reclamation plant which consists of a magnetic separator, crusher, water tank, pump and separator. At the present time, recovery of used $CO_2$ sand is running at about 50 per cent., but the company aims to increase this to 75 per cent. Sand is dried and cooled in the same plant as that used for new sand. The high proportion of reclaimed sand used (50 per cent), has no apparent effect on the properties of the sand—especially with regard to refractoriness—and the surface finish and dimensional accuracy of the castings produced is equal to those made in new sand.

The heaviest casting made by the company to date in a box-less mould weighed 10 cwt. as-cast, the mould measuring 4 ft. by 3 ft. 6 in. by 3 ft. deep. Boxes are used for castings of greater weight, and the work is carried out in the heavy section of the company's foundry.

In conclusion, it is of interest to mention that Springfield Steel Company, Limited, is reputed to be one of the first to use commercial television to advertise its products. The script and film work was undertaken by the company's own staff and considerable emphasis was placed on the fact that the $CO_2$ Process was used for mould production.

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Mr. LIONEL HARPER, a director of Coventry Precision, Limited, has been appointed vice-chairman of the board of the Dowty Group, Limited. Mr. Harper is also managing director of Dowty Hydraulics Units, Limited, and a director of Designex (Coventry), Limited. Mr. E. S. GIBBONS, managing director of Designex, Limited, has been appointed to the board of Coventry Precision, Limited.

Mr. W. CAMPBELL HESELWOOD, head of the physics section of the Swinden laboratories of the United Steel Companies, Limited, Sheffield, has returned from Japan where he attended the third International Conference on Non-Destructive Testing. He also visited Hong Kong, Bangkok and India. Mr. Heselwood is president of the Sheffield Metallurgical Association this year.

# British Steel Founders' Association

## *Annual Conference in Folkestone, October 5 to 7*

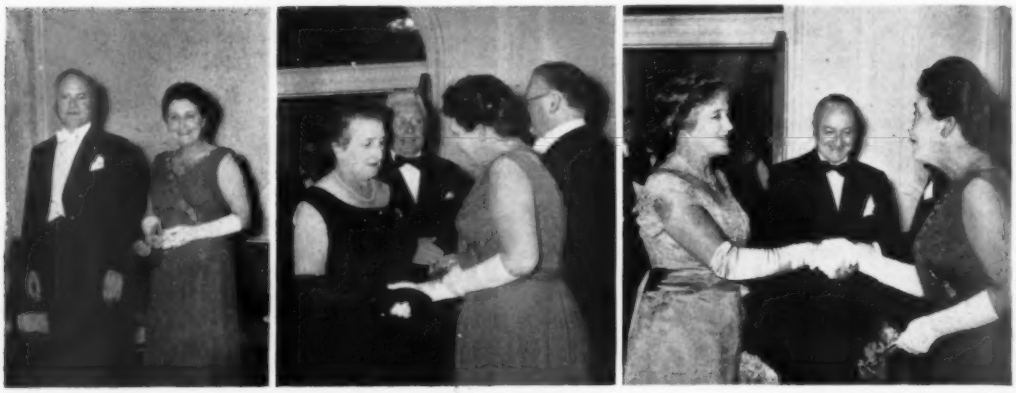
The 1960 Annual Conference of the British Steel Founders' Association, which was held at Folkestone from October 5 to 7, was presided over by Mr. C. H. Kain (Lake & Elliot, Limited), chairman of the Association, and Mrs. Kain. About 100 members and their ladies attended. The opening of the Conference was preceded by a meeting of the executive council at which the appointment of Mr. John Bolton as director and secretary was confirmed.

### General Meeting

At the general meeting of members held on October 6, the chairman reviewed the economic, administrative and legal background to the Association's current and future programme of activities, and made a detailed assessment from his company's records of the levels of steel castings costs and prices, in relation to those prevailing in other branches of industry, currently and pre-war. Taking metal-in-ladle as the basic foundry "raw material," Mr. Kain showed that, in his iron foundry, although the price of pig-iron and steel scrap has increased by about four times since 1937, the selling price of certain speciality castings which, in 1937 was almost three times the cost of metal-in-ladle, is to-day less than twice that cost; and that the selling price of these particular products, the demand for which has greatly increased, had risen by only three times the pre-war price as against a rise of about four times for all foundry raw materials and general engineering castings. This was, he suggested, evidence that "the so-called law of supply and demand is merely an attempt to explain something we do not understand and cannot control."

On the other hand, in the steel foundry, Mr. Kain showed that the cost of metal-in-ladle has increased only about two-and-a-half times as compared with pre-war—a fact which he attributed to the adoption by the industry generally of modern melting equipment. This factor had enabled steelfounders to pass on to their customers a substantial benefit, for whereas in 1940 selling prices of steel castings were, on average about six-and-a-half times the cost of metal-in-ladle, they are, today, on average, only about six times that cost. Or, put another way, the average selling price of

*Members of the Executive Council of the British Steel Founders' Association at their meeting at Folkestone on October 5. Left to Right: Mr. J. Currie (Blackett Hutton & Company, Limited); Mr. F. W. Rowe (K. & L. Steelfounders & Engineers, Limited); Mr. J. G. Allen (Head Wrightson Steel Foundries, Limited); Sir William Scott,* O.B.E., J.P. *(Armstrong Whitworth (Metal Industries), Limited, vice-chairman of the Association); Brigadier A. Levesley,* O.B.E., M.C., T.D., M.I.MECH.E. *(Edgar Allen & Company, Limited); Mr. C. H. Kain,* M.I.MECH.E., F.I.M. *(Lake & Elliot, Limited) (chairman of the Association); Dr. C. J. Dadswell,* ING. E.S.F., M.I.MECH.E. *(English Steel Castings Corporation, Limited); Mr. John Bolton (director and secretary of the Association); Mr. K. V. Robinson (BSFA); Mr. F. N. Lloyd and Mr. M. C. Lloyd (F. H. Lloyd & Company, Limited); Mr. F. A. Martin,* O.B.E. *(Osborn Foundry & Engineering Company, Limited); Mr. G. M. Menzies (North British Steel Foundry, Limited); Mr. D. E. Catton (Catton & Company, Limited); Major W. S. G. Rees (Glanmorfa, Limited); and Mr. D. W. L. Menzies (Bonnington Castings, Limited).*



*(Left) Mr. C. H. Kain (chairman, BSFA) and Mrs. Kain at the reception prior to the Conference dinner on October 6, receiving (centre) Sir William Scott (vice-chairman) and Lady Scott, and (right) Mr. Harold Humphries (Hadfields, Limited) and Mrs. Humphries.*

steel castings is to-day about two-and-a-half times the pre-war price as against an increase in pig-iron and steel-scrap prices of about four times pre-war prices. Thus, he said, "even on to-day's apparently high prices for steel castings, the increase is relatively less than in most other materials."

### Steel Castings Development Committee

The general meeting also received, from Mr. Finlay Crerar (W. Shaw & Company, Limited), a report on the first year's working of the Steel Castings Development Committee—an organization set up between the BSFA and the British Steel Castings Research Association to provide and disseminate data designed to promote the greater use of steel castings. He said it had been recognized that in view of the ever-increasing stringency of the service conditions which many steel castings are required to withstand, engineers and designers have not been provided with the exact technical data which they frequently require. The Committee had therefore sponsored a programme of data collection which was proceeding in the laboratories of the Research Association, and a programme of data publication which would be effected by the provision of teaching aids to technical colleges, lectures to engineering societies, the engineering press, and exhibitions. In addition, consideration was being given to the establishment within the BSCRA of a stress-analysis laboratory where casting-design studies could be made on behalf of steelfounders and their customers.

### Annual Dinner

At the dinner held on October 6, the guests were received by the chairman and Mrs. Kain who were supported at the top table by Sir William and Lady Scott, Mr. and Mrs. F. N. Lloyd, Mr. and Mrs. C. J. Lake, Mr. and Mrs. F. A. Martin and Mr. and Mrs. F. W. Rowe.

### Golf Tournaments

The BSFA Golf Tournaments held on October 7 resulted in Mr. P. B. Lake winning both the BSFA Handicap Cup and the Scratch Cup, his scores being respectively 78 – 8 = 70, and 78.

The "Jopling" Rose Bowl was won jointly by Mrs. Marian Barratt and Mrs. J. I. Nicholson who scored as follow: Mrs. Marian Barratt 87 – 4 = 83 and Mrs. J. I. Nicholson 101 – 18 = 83. Mrs. Kain presented the trophies to the winners at a dinner-dance held in the evening.

## Industrial Output levels out

Industrial output in Britain has been levelling out in the past few months. This is indicated by the latest official estimates of industrial production. The Central Statistical Office put the index for August, seasonally adjusted, at 121-122 on a provisional basis, compared with 121 in July, 120 in June, and 121 in April and May. Thus, the average for June to August was 121, the same as in March to May.

In its latest Economic Review, the National Institute of Economic and Social Research states: "The prospect for the time being is for a slow rise in total demand and output, even if exports stay about level. Investment in stocks is more likely to fall than to rise. Consumers' spending should continue to go up gradually. The prospect for durables is uncertain."

## Board Changes follow Perfecta Merger

Following the recent merger of Hall Engineering Limited, and Perfecta Motor Equipments, Limited, the boards of the two companies have been rearranged. Mr. P. C. Hall, chairman of Hall Engineering (Holdings), Limited, has been elected to the board of Perfecta. He is also taking over as chairman from Mr. G. W. Doolittle, who has retired from Perfecta and its subsidiaries in order to curtail his business activities.

Mr. H. Sutherst, financial director of Hall Engineering, has joined the Perfecta board, while Perfecta's joint managing directors, Mr. G. F. Challinor and Mr. N. J. Stevenson, have been appointed directors of Hall Engineering.

# IBF National Works Visits Day

(*Continued from page* 462)

**In last week's issue of the JOURNAL were published accounts of the background and main features of five of the works where visits would be taking place at the end of the month under the aegis of the Institute of British Foundrymen. Continuing this preview, accounts are now completed with descriptions of the five following establishments:— British Steel Castings Research Association; Staveley Iron & Chemical Company, Limited; Sheepbridge Engineering, Limited; English Steel Castings Corporation, Limited, and Hadfields, Limited.**

## British Steel Castings Research Association

The British Steel Castings Research Association —the only co-operative research organization in the world with its own facilities devoted exclusively to research on steel castings—was founded in March, 1953, as the successor of the Research and Development Division of the British Steel Founders' Association, which was established in 1950. The receipt of financial support from the Department of Scientific and Industrial Research commenced in April, 1954. Its industrial income is provided, in the main, by 62 UK steel foundries who are ordinary members of the Association together with six steel foundries located in Commonwealth countries. Additional sources of income include contributions from companies supplying steel foundry equipment and materials, who are associate members and contributors.

The total income of the Association is approximately £100,000 per annum, and it is worth noting that the subscription income from UK steel foundries corresponds to 0.16 per cent. of their turnover which is twice the national average of industrial contributions to other research associations.

### Facilities and Organization

The Association's experimental foundry, laboratories and offices were opened officially on June 4, 1957, by Sir Harry Jephcott, chairman of the DSIR. They were built and equipped at a cost of approximately £93,000, derived entirely from accumulated revenue.

The considerable intensification of the Association's research programme (brief details of which are given in what follows) soon necessitated extensions, carried out during 1959-60, comprising a lengthening of the experimental foundry and laboratories building, and the addition of a first floor to the administrative and office building. These extensions—which were inspected with great interest during the recently held open-days by some 550 visitors, comprising representatives of member companies, other research associations, and users of steel castings in general—brought the total cost of buildings and equipment to approximately £200,000. The staff totalled 72, including 21 graduates, at the end of March, 1960, 45 persons being directly engaged on research work.

The director of the Association is Dr. A. H. Sully. Mr. C. M. Stoch, previously head of the engineering section, was recently appointed assistant director. The investigational work is organized in four sections: Foundry processes (head of section, Mr. J. M. Middleton); metallurgy (Mr. W. J. Jackson); steelmaking (Mr. K. Knaggs); and engineering. Mr. W. E. Fuller is the information officer. The secretary of the Association from 1954 to September, 1960, was Mr. J. Bolton, recently appointed director and secretary of the British Steel Founders' Association. Mr. E. R. Smith is now the secretary.

*Part of the experimental foundry of the British Steel Castings Research Association, to which considerable extensions were made in* 1959/60.

*The exact temperature of metal being poured has been taken with an immersion pyrometer in the experiment being carried out at the BSCRA foundry on a batch of moulds made to test the refractory properties of mould washes.*

The foundry provides facilities for pilot-scale work on steelmaking, and all foundry processes, and several spacious and well equipped laboratories are devoted to work on foundry sands, mechanical testing, metallurgy, chemical analysis, the determination of gases in steel, and atmospheric-dust and fumes. A large machine shop is engaged in the construction of experimental equipment, and in the preparation of test pieces.

### Results So Far

In the annual report for 1960, the Association's director of research (Dr. A. H. Sully) stated that three individual research projects of considerable practical importance had reached a stage when the results may, with advantage, be applied by member companies. These projects relate to the oxygen-injection in electric-arc furnace steelmaking; to improved mould-paints and washes; and to the application of ultrasonic techniques in the examination of castings. The respective findings are being demonstrated in member foundries by the Association's staff.

### Projects in Hand

It is clearly impossible to give full details of the current programme of research in this brief account of the work of the BSCRA and only a few of the projects being investigated by each of the above four sections can be mentioned.

*Steelmaking Section*

Problems connected with the desulphurization of liquid steel (with special reference to the slag reversal process) and pinhole porosity (joint project with the foundry processes section) are being examined.

*Foundry Processes and Moulding Materials Section*

Investigation of the factors affecting the surface quality and soundness of castings, moulding sand compaction, exogenous inclusions, and bonding agents, is being carried out.

*Metallurgy Section*

Phenomena being studied are microporosity, heat treatment (with special reference to shortened cycles), intergranular fractures, and deoxidation.

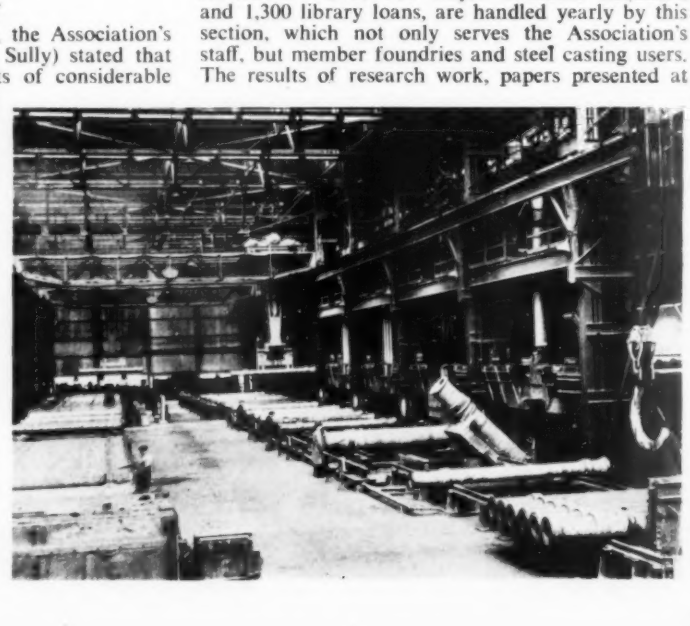
*Plant Engineering and Industrial Health Section*

The subjects engaging attention here are sand reclamation, blast cleaning, mould drying, atmospheric pollution, and noise abatement.

Further work is also being done on the ultrasonic examination of steel castings, for which as mentioned above certain practical results are already available.

### Other Services

Abstracts from the world literature on steel founding, and allied topics, are published by the library and information section in *BSCRA Abstracts*. Over 500 major technical enquiries, and 1,300 library loans, are handled yearly by this section, which not only serves the Association's staff, but member foundries and steel casting users. The results of research work, papers presented at



*A general view along the sand-spinning foundry of Staveley Iron & Chemical Company, Limited, where cast-iron pipes are made centrifugally in sand moulds.*

the annual conference, proceedings at discussion groups, and news items are made available to members in the *Journal of the BSCRA*, and associate members receive a *Circular*. Titles of books published by the Association include "British and Foreign Specifications for Steel Castings (Part 1)"; "Data Sheets on Moulding Sands"; "Data Sheets on Dust Collectors," and "A Practical Guide to the Design of Steel Castings," all of which have been received with considerable interest, both by members and by organizations outside this industry. Films are produced from time to time and made freely available on loan; *e.g.*, the recent 30-min. film "Let's Clear the Air," which shows the work of the BSCRA on dust control in steel foundries, has been widely shown both in the UK and abroad.

## Staveley Iron and Chemical Company, Limited

Staveley Iron and Chemical Company, Limited, near Chesterfield, consists of two major industrial plants on a single, extensive site, divided by the River Rother. On one side stand four blast furnaces and a double-strand casting machine, batteries of coke ovens, a tar plant and a wide range of chemical-producing installations. These comprise the Company's Devonshire Works.

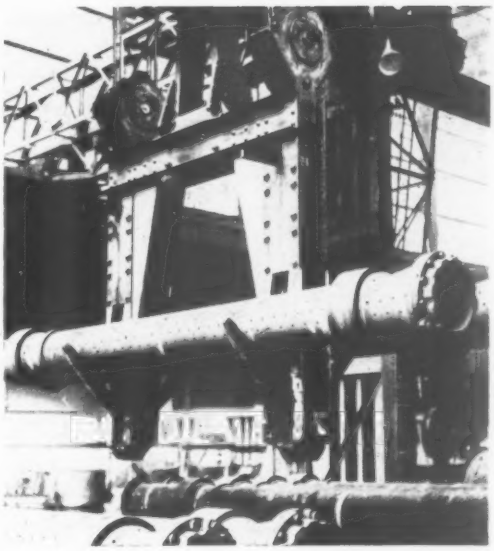
From the furnaces of these works comes foundry pig-iron, most of which is used in the company's pipe-making and foundry plants. The remainder, which includes a range of high-, low-, and medium-phosphorus iron, is sold at home and abroad, to founders making many types of castings.

Many industries are served by the basic materials supplied by the chemical works. Products include: sulphate of ammonia, benzole, toluole, naphtha, naphthalene (flake, powder and ball), pyridine, nitrobenzole, aniline oil and salt, creosote oil, crude carbolic acid, cresylic acid, refined tar, pitch, anthracene and anthracene oil, stabilized sulphur trioxide, sulphuric acid, oleum, sodium bisulphate, caustic soda, liquid chlorine, hydrochloric acid, sodium hypochlorite, soda crystals, sodium chlorate and anhydrous orthosilicate of soda.

### Foundries

On the other bank of the Rother are the foundries, which include workshops making cast iron pipes for the water, gas, and sewage services in Great Britain, and many places abroad. In addition, there are foundries for special castings, with machine-, fitting-, boiler-, patternmaking-, and woodworking-shops.

At the foundries is the only plant in Great Britain which makes cast iron pipes by the sand-spun process. They are manufactured in 18-ft. lengths, in a range of diameters, from seven to 24 in. Centrifugally cast in sand moulds, they combine the qualities of vertically sand-cast pipes, with the metallurgical advantages of centrifugal action. The heat treatment which has to be applied to pipes centrifugally cast, in water-cooled moulds, is not necessary in the sand-spun process.



*The flask being transported on a specially designed crane cradle is used in the sand-spun process, unique in this country for producing cast-iron pipes. (Staveley Iron & Chemical Company, Limited.)*

Staveley also produces metal spun-pipes from 2- to 15-in. diameter, spun in 12- and 18-ft. lengths, and pipes of large diameters are vertically cast in other pipe shops. There is a wide variety of flexible joints, and special fittings are also produced in the foundries. Separate plants apply bitumen sheathing to the pipes as extra external protection, or concrete lining as internal protection, to order.

Wood-wool, and wood-wool rope are also manufactured, coke and ganister are marketed, and bricks, produced in a nearby works, serve a wide surrounding area.

### Welfare and Training

The company employs nearly 5,000 people, many of whom live in two housing estates owned and administered by Staveley. There are separate laboratories for chemical and foundry plants, a central research department, baths, canteens, and training centres. Foundry apprentices are segregated for the full apprenticeship period, with the object of providing thorough practical training, and to encourage youngsters to develop, at an early age, the confidence and sense of responsibility, demanded by skilled foundry work.

It is a condition of service that every male junior employee in the works completes a course in first aid, and there is a thriving St. John Ambulance Corps, with divisions for ambulancemen, nurses and boy and girl cadets.

*National Works Visits*

Within sight of the works, is a magnificent sports ground with a combined cycling and running track, football, hockey and cricket pitches, and bowls, tennis and putting greens. E. McDonald Bailey made the last record of his great career on the 220 yards straight track of the ground, which was opened by the Marquess of Exeter.

## Sheepbridge Engineering, Limited

The Chesterfield works of Sheepbridge Engineering, Limited, occupies a site of some 50 acres and employs over 2,000 people. In its present form the company was incorporated in 1948, but its history dates from 1856, with the formation of the Dunston and Barlow Company's Iron Works, which later became the Sheepbridge Coal and Iron Company, Limited. Besides the expansion of their coal and iron interest, the company's heavy engineering activities also grew markedly, and in World War II over 1,000,000 anti-aircraft shells were produced at Chesterfield, as well as bomb-casings, cylinder-liners, and other equipment. The Sheepbridge group now consists of 15 companies with their administration centred at the Chesterfield works, on which site are located the works of two subsidiaries, Sheepbridge Equipment, Limited, and Sheepbridge Stokes, Limited.

### Sheepbridge Equipment, Limited

Sheepbridge Equipment, Limited comprises foundry and engineering divisions, the former of which is dealt with in some detail in the following:—

*Scope of foundry*

The foundry was newly built in the early 1950's, and includes a large floor moulding section capable of producing iron castings up to 12 tons in weight, and there is also a mechanized section for the quantity production of smaller castings. The foundry tends to specialize in high-duty and alloy-irons, including such materials as NiResist, 30 per cent. chromium NiHard and spheroidal-graphite iron, and also produces steel castings up to approximately one and a half tons in weight, the metal being obtained from a two-ton Tropenas converter using oxygen injection.

Employing some 270 people, the output of finished iron and steel castings is approximately 150 tons per week, about 30 per cent. of which is consumed within the Sheepbridge organization.

*Melting equipment*

Besides the converter already mentioned above, other melting equipment includes a pair of three-ton per hour hot-blast cupolas, two six-ton per hour cold-blast cupolas and an oil-fired rotary furnace.

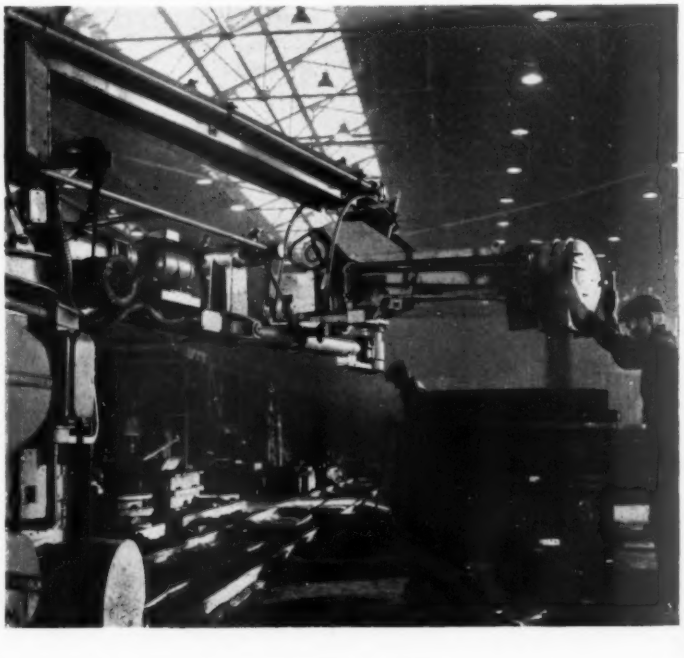
*Sand plant*

Sand is supplied to moulding machines, for the mechanized and batch section, from two 20-ton per hour August mills, which feed an endless belt carrying the sand overhead to the moulding machine hoppers. Return sand is deposited into underground hoppers at knock-out, and passes from thence by a belt system, through magnetic separators and rotary screens, to three 50-ton storage hoppers.

*Production techniques*

In the medium floor-moulding section ramming is done by a travelling sand slinger, and the $CO_2$ process is extensively used. Another sand slinger, stationary in this case, is used for heavy floor moulding.

Although most of the moulds are either green sand or $CO_2$, the foundry also uses an automatic shell-moulding machine for the production of such castings as thin cylinders, cranks, and aircraft components.



*A travelling sandslinger is here depicted at work on the "ramming" of a multi-part circular mould in the medium floor-moulding section of the foundry of Sheepbridge Equipment, Limited.*

*This quadruple vibratory shake-out is used at English Steel Castings Corporation's foundry for knocking-out boxes up to 25 by 10 by 4 ft. deep after casting.*

*Other departments*

In addition to the above the foundry has a well-equipped core shop, fettling shop, and pattern shop. Any heat treatment or machining which is required, is carried out by the Engineering Division of Sheepbridge Equipment, Limited.

*Industries Served*

This division maintains a link with the coal mining industry through the supply of haulage gears, pithead gear, mine cars, etc. Complete quarrying plants, including crushers and screens, are supplied for quarrying and civil engineering projects throughout the world, and Sheepbridge Equipment, Limited, is also well known for its specialized machine tools, structural steel works, and as machinists to the heavy-engineering industry.

### Sheepbridge Stokes, Limited

Sheepbridge Stokes, Limited, first began operation in 1917, producing centrifugal castings intended for the manufacture of cylinder liners and piston rings. Today, centrifugal die-castings ranging from a few pounds to 5 tons in weight, and in size to a maximum of 54 in. diameter by 12 ft. long, are produced in a wide range of plain, high alloy and s.-g. irons, with tensiles ranging from 14 to 50 tons per square inch. A small, but efficient, single cast piston ring foundry has enlarged the scope of the company's activities in the automotive and diesel fields. The foundry today with its ancillary departments occupies an area of 50,000 sq. ft. and together with the fettling department employs approximately 300 people.

*Melting and Heat-treatment*

The melting equipment consists of one pair of 5 tons per hour cupolas, two pair of 3 tons per hour cupolas, two 30 cwt. capacity mains frequency induction-furnaces, and two 1 ton capacity oil-fired rotary-furnaces. The raw materials are delivered to the foundry's sidings and mechanically handled from the wharf to the cupolas. Metal is continuously tapped from the cupolas into receivers and delivered by a monorail system to the smaller moulding machines, while for the larger machines a 3 ton oil-fired holding furnace is employed. The induction and rotary furnaces are used for the melting and duplexing of special irons. The weekly melt is over 750 tons, from which many thousands of castings of all sizes are produced.

For the heat treatment of castings there is available a gas-fired 6 ton capacity annealing furnace, six nitriding furnaces, and a high-powered induction-hardening set.

*Other Features*

A conveyor system takes castings through the inspection department, and thence to the machine shops, which are fully equipped for rapid and automatic machining. Also attached to the foundry is the die preparation department which is concerned with the upkeep of dies, the stock of which numbers more than 3,000.

The social side of the employees' life has not been overlooked by the company and excellent canteen facilities are provided. During leisure hours, tennis, bowls, football, cricket, etc., may be enjoyed on the large sports' field.

## English Steel Castings Corporation, Limited

In 1855, after a visit to Germany, Col. Tom E. Vickers, son of one of the early pioneers of the present English Steel Corporation organization, introduced to Great Britain, for the first time a successful method of making steel castings, which a Bochum steelfounder, Jacob Meyer, had discovered the previous year.

At the old Millsand Works in Sheffield, belonging to Naylor, Vickers & Company (an early precursor of ESC) Co. Tom E. Vickers began casting Britain's first steel cog wheels and railway crossings, using a moulding compound—which eventually became known as "Sheffield Compo"—made of calcined fireclay, obtained from old

*Magnetic crack-detection being carried out at the English Steel Castings Corporation foundry on a casting weighing* 125 *tons.*

crucible melting pots, mixed with a small quantity of new clay, to make it plastic.

His most notable venture, however, was the production of the steel bells, which in the succeeding years, literally rang round the world. Over 7,000 had been produced by 1880, and, as well as being sold locally in the British Isles, were also supplied to places as far apart as America, Russia, New Zealand, Syria, and West Africa.

Before the end of the last century, however, the company had started producing heavier steel castings, such as ships' propellors, structural and other marine castings, and bell founding was discontinued.

### Present Structure

Today, the Grimesthorpe Works of English Steel Castings Corporation, Limited, one of the ESC subsidiaries, operates one of the largest and most modern foundries in Britain, and, in producing steel castings ranging from a few pounds up to 185 tons individual weight, has, what is considered to be, the biggest range, and variety, of steel castings made by any one company in the world. Occupying an area of 30 acres, English Steel Castings Corporation, Limited, employs nearly 1,000 people.

*Moulding*

It will be appreciated from the following that it is on the one hand a heavy jobbing foundry, but on the other hand, it has also several mechanical moulding bays for medium and lighter work which include the use of two speedslingers. The heavy moulding bays contain casting pits with a total length of 436 ft., and it is from these pits that come castings such as roll housings, crosshead beams, and entablatures, some of them weighing in the region of up to 185 tons each. Special pits, some as deep as 25 ft., are used for casting cylinders and heavy rolls, of which the weight has been as much as 107 tons. Amongst other work, currently being produced from these large pits, is a mill housing, each one of which takes 168 tons of liquid steel. One of these is being made every 7 days for one contract alone.

*Melting*

Steel for castings is melted in electric-arc and Siemens open-hearth furnaces, and the maximum liquid steel used for castings in any one week during 1960 was 760 tons.

*Sand Plant*

There are three major self-contained sand-handling plants, two of which are designed to produce up to 50 tons of unit sand per hour. These two plants are each controlled from central points, thus minimising the use of labour for sand preparation.

*Knockout*

On the floor used for ramming moulds up to 25 ft. by 10 ft. by 4 ft. deep, by a speedslinger, there is a quadruple vibratory shake-out for knocking out these boxes after casting.

*Inspection*

All the modern techniques for the non-destructive testing and examination of castings, gamma and X-ray examination, ultra-sonic testing and magnetic crack detection are used for the checking of processes, and production methods, in all the ranges of castings made.

*Training and Welfare*

Every care is taken in the selection and training of people. Good practical training facilities are provided for the training of apprentice moulders and patternmakers, student and graduate engineers, metallurgists and foundry technologists. Courses of further education are provided through part time day classes, sandwich, and university courses. The needs of engineering and management grades are met by courses within and outside the company. Showers, locker rooms and canteen are available to the employees, and excellent sports facilities exist at the ESC group's sports' ground at Shiregreen.

## Hadfields, Limited

Hadfields, Limited, East Hecla Works, Sheffield 9, was founded in 1872 by Robert Hadfield, who was apprenticed in his early days to a local engineering concern. Today, the area occupied by the works amounts to over 200 acres—all actively occupied.

### Steel Melting

The melting departments of Hadfields, Limited, have been designed for the production of alloy steels and special grades of carbon steel of the highest qualities. The commoner grades of carbon steel, used in bulk for structural and general engineering purposes, are not normally produced. Steel

for castings is produced by most of the well-known melting methods, using both acid and basic processes, the largest unit being a 60-ton tilting open-hearth furnace. In addition, there are three other open-hearth furnaces, each of 45-tons capacity. In the electric arc-melting departments, there are seven furnaces with a charge capacity ranging from 4 to 25 tons and from these, steel is produced for foundry use for castings. High-frequency melting is represented by a plant which supplies liquid steel from units of 2-tons, 1-ton, 10-cwt. and 2-cwt. capacities, and this process is particularly valuable for the production of very highly alloyed steels, such as heat-resisting, corrosion-resisting, and tool steels, and is a source of the base material for use in wax investment casting. For experimental work, the research department of the company also has a unit which produces melts of 18 lbs. In addition to the processes already mentioned, large quantities of steel are made for foundry use by the acid-side-blown converter process.

### Steel Foundry

In Hadfields' steel foundry, over 600 tons of fluid steel for some 30,000 castings per week can be produced from Tropenas converters, electric-arc and high-frequency furnaces. Castings from a few ounces to five-tons in weight are in regular production, in corrosion and heat-resisting alloy steels, as well as castings up to 30-tons in weight in "ERA" manganese-steel and in carbon- and low-alloy steels. Moulding is carried out by hand, by pneumatic rammer, and machine moulding methods. The carbon-dioxide process for moulds and cores, is used, the latter also being made by shell-moulding methods. Sand-milling plants are used for the preparation of facing sands and of reclaimed backing sand. A supply of sand is constantly being recovered from the Hydroblast unit in the fettling shop. The physical properties of the sand are constantly checked by the sand control laboratory.

### Fettling and Heat-treatment

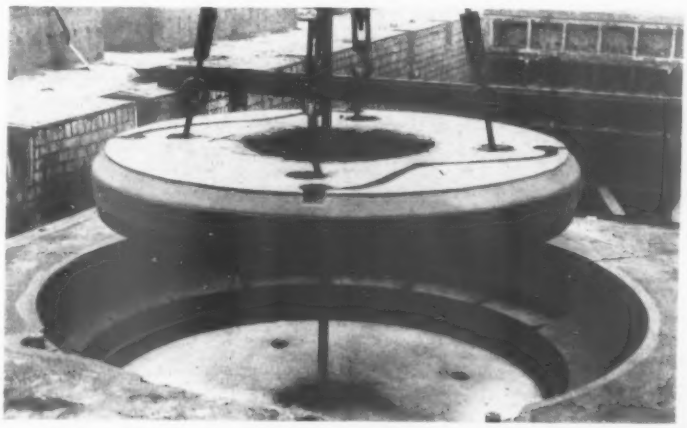
The cleaning and "de-coring" of castings is effectively carried out in shops equipped with the most modern dust-extraction plants, the castings being cleaned by Hydroblasting, wheelabrating, shot- and grit-blasting, and pneumatic chisels. Feeder-heads and runners are removed by knock-off, oxy-acetylene, and the powder cutting processes and high-speed abrasive cutting wheels are also used. The finishing facilities include arc/air torches and hand-, and high-speed machine-grinders. Routine quality checks are made by acid pickling, penetrative dye, radiography and magnetic crack-detection, and constant supervision is exercised by highly-qualified technical and metallurgically trained staffs, at all stages. All steel castings are heat-treated, some of the low-alloy steel castings receiving two, or even three, treatment operations, to develop the desired physical properties.

### Machine-shops

The extensive machine-shops at East Hecla Works have been specially designed and equipped to deal with large-scale engineering projects for the chemical, aircraft, marine, railway, paper-making, electrical, and ferrous- and non-ferrous metal industries. A comprehensive range of crushing machinery for the mining and quarrying of minerals, is manufactured. Earth moving equipment is also a major product. The machine tools include automatics for the machining of small components, on a mass production basis, in addition to planing, turning, boring and grinding facilities, for large steel castings. Recent innovations have been introduced in the turning and grinding sections, where up-to-date production methods and facilities are employed.

### Pattern-making

Good patterns are the first essential to the production of steel castings of high quality, and the pattern shops of the company are equipped with the latest machinery for the making of strong and acurate patterns, and coreboxes. Wooden patterns are produced from selected timber, and are constructed so as to maintain their shape and remain unaffected by damp sand, or by atmospheric changes. Where large quantities of castings of high accuracy are involved, metal patterns are prepared. The introduction of epoxy-resins has enabled patterns to be produced quickly and cheaply. Extensive and well-organised stores ensure careful protection of customers' patterns, which are immediately available for repeat orders.



*In this photograph a core is being set in the mould for a steam turbine casing prior to the closing at the East Hecla Works of Hadfields, Limited.*

*Careful coring-up is being carried out in Hadfield's foundry on this Pelton-bucket mould. Note the heavy grid—stabilized by wooden blocks—to which a ring of hooks (engaging in the core) is bolted to share the lifting strain.*

### Other Departments

The mechanical-testing laboratories at East Hecla Works are equipped for the preparation of the necessary test pieces (some 15,000 to 20,000 tests are conducted and recorded annually for customers' inspectors), and for carrying out physical tests. The testing equipment includes apparatus for tensile-, creep-, impact-, fatigue-, bend-, and hardness-tests, and facilities for conducting such tests at high temperature, and sub-zero temperatures and/or under corrosive conditions. Other apparatus in use includes equipment for the determination of magnetic and electrical properties, thermal conductivity, and thermal-expansion. The laboratories are also able to carry out crack detection and X-ray, gamma-ray and ultrasonic inspection. Micro-determination of grain size and cleanness are also carried out as may be required.

In the field of research, the works' chemical, physical and metallurgical laboratories are well equipped with modern scientific aids and instruments, and studies are made of the properties of all types of steel products together with those of the many materials used in the production of steel, including fuels and refractories. A section is devoted to the development and maintenance of scientific instruments, pyrometers, and other electrical apparatus, which is essential to modern technical control of the making of high-quality steels.

### Welfare and Social Amenities

Large and well-equipped medical centres, staffed by state-registered nurses and under the direction of a full-time medical officer, are provided for the benefit of the company's employees. There is a general training committee for the supervision and organisation of training for young employees, who work under the guidance of a trained officer and several craft instructors. Several junior-executive- and foreman/supervisors courses are organized during the year, and every encouragement is given in establishing first-class training facilities. Technical training is provided for at day-continuation and evening schools, and grants are awarded on the reports received, in association with the standard of the apprentice's work in the plant. Use is also made of technical films which are exhibited in the works' cinema.

Social amenities are not forgotten at East Hecla Works, and there are facilities for indoor pastimes, such as badminton, table-tennis, etc., in addition to a large sports ground covering 14 acres, which provides accommodation for cricket, football, hockey, tennis and bowls. A new sports pavilion was opened in 1956 and this can accommodate approximately 70 persons.

* * * *

AN ERROR has been pointed out in last week's section of the National Works Visits Day account dealing with equipment available for shell moulding at Osborn Precision Castings, Limited. The paragraph which began the second column on page 461 should have read "Two smaller (gas-heated) Polygram units, which each carry two patternplates 16 by 14 in., are also in use which can achieve a production rate of 20 complete full-sized moulds per hour from each machine. In addition, there is a twin-station FLCB machine using a patternplate 24 by 16 in. and one gas-operated oven." Apologies are recorded to all concerned.

# Are Trucks Machinery ?

*By "Barrister-at-Law"*

The question as to whether a truck which is used for the conveyance of products, etc., in a foundry constitutes "machinery" in the sense that it should meet the requirements of S.14 of the Factory Act 1937 is not a simple one. There is no clear definition in the Factories Act of the word machinery—it is defined merely as including a driving belt. Moreover, there is but little guidance as to its meaning in any other provisions of the Act.

Part 2 of the Act deals with the safety provisions which have to be observed in factories, and sections 12, 13 and 14 deal with the position regarding what may be described as production machinery—machinery which is used in connection with the manufacture of particular products of a factory. It is difficult, however, to apply any of these provisions to a self-contained unit such as a truck, since the dangers arising from it moving about ferrying articles to and fro in a factory are quite different from the dangers arising from the type of machinery dealt with in, for instance, S.14, prime movers and transmission machinery. Again those sections concerned with hoists and lifts; chains, ropes and lifting tackle; and crane and other lifting machinery—sections 22, 23 and 24 respectively—can have no application.

### Principle of Construction

One therefore has to consider the word machinery on the general principle of construction, and this principle is to the effect that when construing ordinary English words, any attempt at definition should be eschewed. The words should be construed in a commonsense way and be given their ordinary commonsense meaning.

An example of the application of this principle is afforded by the recent case of Kimpton *v.* the Steel Company of Wales, Limited, where it was held that three steps in a factory did not constitute a "staircase" so as to require the provision of a handrail, under the Factories Act.

### "Machinery"

Guidance may also be obtained from another decision, that of the House of Lords, on the Parvin *v.* Morton Machine Company, Limited, case, which clearly indicates that the word "machinery" is not to be given a wide meaning. In that case it was held that the word could include only such machinery as was employed *in the processes of manufacture or as ancillary to such processes.*

It would therefore exclude machinery which had been manufactured in the factory. Machinery, therefore, means machinery in the ordinary use of language, and a truck which is used for the conveyance of articles in a foundry would be merely a vehicle not "machinery," otherwise it might equally be said that every motorcar in the factory was also a machine.

### Cherry *v.* International Alloys

A case where the Court had to consider whether a truck constituted "machinery" and therefore was required to be fenced, was that of Cherry *v.* International Alloys, Limited. In this the plaintiff was engaged as a motor mechanic in the foundry which produced various kinds of alloy materials. There were a number of trucks there, some powered by electricity and others by petrol. These trucks were used for carrying and removing the materials produced in the works. The plaintiff was an experienced mechanic and it was part of his duties to attend to the maintenance of the trucks.

One day in the course of attending to a truck in part of the electricians' shop, he replaced a broken fan belt and took the opportunity at the same time, of adjusting the oil feed. It was necessary to make this adjustment with the engine running, and to effect it, a small wheel had to be turned by the fingers and a nut tightened with a spanner. The plaintiff was tightening the nut by moving the spanner upwards, when the spanner slipped and his right hand was caught by the revolving fan and seriously injured. The fan was normally enclosed by a louvred plate or guard, but this had to be opened downward to give access to the oil feed, so that the fan was left unguarded while the adjustment was being made. The adjustment itself was a simple operation and one which was frequently carried out. The truck had been in use in the foundry for a considerable time and there never had been any guard or protection other than the outside louvred plate. It was contended on the plaintiff's behalf, that the fan was a dangerous part of "machinery" and that it was unfenced and not in such a position or of such construction as to be safe, as it would be if securely fenced.

The Court held that the truck did not constitute "machinery" and that accordingly there was no statutory obligation to fence it. The plaintiff's claim for damages for breach of the alleged statutory duty to fence under S.14 of the Factories Act 1937 failed.

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ALBION MOTORS, LIMITED, Glasgow, have received from the Federation of Malaya an order for 170 tipping chassis valued at £320,000. The order was placed through Leyland Motors, Limited, the parent company.

Mr. G. E. DIX, who joined Massey-Ferguson, Limited, at the end of 1959, has been appointed general purchasing manager, UK Operations. He will be succeeded as purchasing manager of the company's Banner Lane plant by Mr. D. W. STEVENS.

# Notes from the Branches

## Northampton Section

The Northampton section of the Institute of British Foundrymen opened the 1960-61 session with a visit to the Imperial Foundry of the Ford Motor Company, Limited, at Leamington. The party which totalled 38 arrived at the works at 10.30 a.m. and were greeted by Mr. A. J. Rayment, foundry superintendent, who took members first to the well-equipped canteen for refreshments. At this stage the guides were introduced and the visitors split up into small parties of seven or eight.

Production at the foundry runs to 1,000 tons per week of iron, steel and malleable castings to supplement production from the Dagenham and Thames foundries. The work includes camshafts, crankshafts, hubs, brake discs and drums, etc., for which three moulding units are provided. Of these, two out of the three work continuously day and night. A considerable amount of overtime is being worked, including Saturdays, to meet production requirements. The total labour force is 1,400, but a very large number of the castings are machined before despatch, and machine-shop personnel are included in the quoted figure. The foundry is well organized and is doing an excellent job, but it is by no means new, having been equipped during the war to make track-links for tanks and subsequently developed for peace-time production. The layout, therefore, could not be described as ideal but considering the volume of work being turned out it would be very difficult to improve upon.

A description of the equipment used for the production of steel and grey-iron for casting was printed in the JOURNAL (March 24, p. 371) on the occasion of the visit by the Birmingham and London branches, when it was noted that the iron is produced from three cupolas of shell diameter of 72-in., 84-in. and 96-in. dia., these being semi-mechanized so far as charging is concerned, and all can deliver metal into a 5-ton oil-fired holding furnace which feeds small (300-lb. capacity) ladles. The four steel alloys—including the Ford malleable—are produced from two cupolas of 96-in. dia. working with a 5-ton Tropenas converter to keep a 10-ton electric-arc furnace supplied with metal for a series of 300-lb. ladles, as used for pouring iron. Granulated slag passes to overhead hoppers for easy discharge into lorries. The moulding machines employed are mainly of the jolt-squeeze type well served by a comprehensive conveyor system for taking the moulds and returning box-parts.

### Other Sections

Continuous conveyor and barrel-type shotblast machines are in use in the fettling shop, the whole of which, of necessity, is very well laid out to cope with the high throughput tonnage and the need for normalizing of the steel castings and annealing of the malleable. Members were interested to note that although these castings have to be hauled by road transport to Dagenham, the returning lorries bring back pig-iron which makes for considerable economy. Other sections visited were the sand and metal laboratories and the patternshop. Some shell coremaking was seen but this would constitute less than 5 per cent. of the total. The major part of coremaking is carried out in the conventional way on large blowers and coreshooters as well as by hand ramming.

A large stockyard was well serviced by mobile cranes and lifting magnets for handling raw materials, all of which come in by road. A feature of particular note was the extensive use of overhead monorail conveyors, a typical example of the very efficient Ford system.

An excellent luncheon was provided in the works canteen after which Mr. Rayment asked members if they had any questions, but it appeared that the guides had already adequately dealt with queries. The visit ended with a vote of thanks being voiced by the president, Mr. R. Jelley, who thanked the Ford Motor Company very warmly for the excellence of the arrangements and the great interest and generous hospitality shown.

## South Africa

A plea to South African engineers and designers to be more specific in their requests for materials in which castings were required, was made by Mr. C. G. S. Webster, A.I.M., in a paper presented to the first meeting of the 1960/61 session of the South African branch. It was held in the Pharmacy House, Johannesburg, under the chairmanship of Mr. J. Peers, vice-president.

The author who entitled his paper "Standards and Specifications" pointed out that although in the worlds of art and music and the humanities, refusal to follow the herd might be a good thing, in industry it often led to frustration and failure. In the foundry, the use of specifications and standards made a difficult job easier and results more certain. Practically every metal used by the foundryman was covered by a specification, and a customer who specified a standard material greatly benefited the foundry that had eventually to make the casting.

*Cast Iron*

Broadly speaking, said Mr. Webster, metallurgical standards or specifications dealt with the chemical or physical properties of metals and these properties were complementary in that if the chemical specifications were fulfilled and, in the case of castings, foundry methods were up-to-date, then almost invariably physical requirements would be fulfilled.

In the case of cast irons, with particular reference to BS 1452/1956, the author said only the physical properties are specified, the different grade designations, 10, 14, 17, 26, etc., denoting the minimum tensile strength acceptable for certain casting sections. As no chemical requirements are laid down, the metallurgist is allowed a fair amount of latitude for carbon, silicon, manganese, phosphorus and sulphur contents as long as the physical properties conform to those specified for a particular section. By suitable adjustment of the five main elements plus inoculation with calcium silicide or ferro-silicon, it is possible to meet grade 17, but beyond that the mechanical properties are such that it is almost invariably necessary to add alloying elements, such as nickel, chrome and/or molybdenum, to meet the provisions of the specifications for grades up to and including Grade 26, unless heat-treatment is resorted to.

After dealing with the various types of cast iron, such as grey- and high-duty irons, the author appealed to engineers and designers to consult the foundry when in any doubt about the proper standard to meet requirements.

*Steel*

On the subject of steels it was stated that the correct use of standards and specifications would lead not only to the use of the most suitable materials, but would also prevent the wasteful over-alloying of steels with expensive elements. The correct use of alloy steels could be facilitated by the customer giving as much information as possible regarding the end-use

of the component with reference to temperatures, atmospheres, concentrations of liquids to be handled, etc.

It was particularly essential in the case of heat-resisting steels that the fullest information be given regarding operating temperatures as types of gaseous atmospheres may be encountered.

*Copper-base Alloys*

In the copper-base-alloy field, the use of certain materials had become accepted almost as a tradition, *e.g.* phosphor-bronze for some types of bearings. Over the past few years, however, alloys had been developed which either threatened, or had already supplanted some of the traditional alloys. Several of the copper-base alloys were capable of being heat-treated to give mechanical properties rivalling those of carbon or low-alloy steels. Non-ferrous materials of the high-tensile types might be expensive but under certain circumstances they were the only suitable proposition.

After a brief discourse on light alloys and testing of metals, the author concluded by saying that technological advances in the various branches of engineering might call for some re-thinking on the part of foundrymen and metallurgists to meet the challenge of designers who might be attempting to take advantage of developments in industries very remote from the foundry. To do this, the founder must be able to guarantee as far as humanly possible, that his products were capable of meeting the demands made of them. This could be done only by operating to rigid standards and specifications which would ensure that the designer's theoretical calculations, using known physical properties, would be borne out in practice by the provision of sound castings.

A lively discussion was concluded with the proposal of a hearty vote of thanks by the immediate past-president, Mr. K. H. Coombs.

## *West Riding of Yorkshire*

The first, second, and third prizes in the pattern-making section of the S. W. Wise Apprentice Competition, organized by the West Riding of Yorkshire branch, were won by apprentices employed by Hepworth & Grandage, Limited, engineers, of Bradford. They were Mr. D. Booth, Mr. B. Ridgeway and Mr. C. Fawcett, respectively. Mr. D. Smith, apprentice with the Metal Box Company, Limited, Shipley, was fourth. In the moulding section, the first prize went to Mr. J. E. Farrer, Kaye & Company (Huddersfield), Limited, and the second prize-winner was Mr. M. Robinson, who is employed by the Adda Engineering & Welding Company, Limited, Bradford.

## *Tees-side*

The Tees-side branch is again organizing its foundry apprentice competition, which is open to apprentices who are under 21 years of age at the date of entry, and who are employed on Tees-side. The four sections of the competition cover pattern-making: cast-iron, steel and non-ferrous moulding. There will also be a short paper competition. Arrangements are not yet complete and full details will be published shortly.

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IMPERIAL CHEMICAL INDUSTRIES, LIMITED—Mr. Alfred Ratcliffe has been appointed a director of the metals division, and a joint managing delegate director of Marston Excelsior, Limited, a subsidiary. He will also join the board of another subsidiary, Lightning Fasteners, Limited. Mr. W. Robson has retired as joint managing delegate director of Marston Excelsior.

# *Equipment and Supplies*

## Thermometer for Surface Temperature

A thermometer claimed to give rapid and accurate reading of surface, liquid or gas temperatures, is now being produced by Measuring Instruments (Pullin), Limited, Electrin Works, Winchester Street, Acton, London, W.3. Known as the MIP Thermeter, the instrument is said to be ruggedly constructed yet is light in weight, and can be carried in a pocket. It is available in two types—one scaled at plus 10 deg. C. to plus 110 deg. C., and the other at minus 40 deg. C. to plus 10 deg. C. The response is approximately 15 seconds from normal ambient, dependent upon the heat-source capacity and thermal conductivity of the material on which the temperature is being checked. To minimize errors in taking readings under difficult conditions, the anti-parallax scale is used for the instrument. Microgap switches have been incorporated, and although the standard probe is designed for surface-temperature measurement, it can also be used when immersed in liquids and alternative probes are available.

## Nimonic Alloy

The latest addition to the Nimonic series of creep-resisting alloys introduced by Henry Wiggin & Company, Limited, Thames House, Millbank, London, S.W.1, is Nimonic 115. It has been released against a test specification of 7 tons per sq. in. at 980 deg. C., with a life to rupture of 75 hr. minimum, which indicates a considerable increase in operating temperature on the previous alloy Nimonic 105 (7 tons per sq. in. at 940 deg. C. with a life to rupture of 50 hr. min.) plus a 50 per cent. increase in creep life. The development of the alloy has been associated with a possible test requirement of 35 hr. to rupture at a stress of 7 tons per sq. in. at 1,000 deg. C.; production quantities against this criterion, however, are not yet released. The 115 alloy is already being supplied to several engine-builders and is in use for blades of certain advanced designs of gas-turbine engines.

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**Impact Testing**

A pendulum-type impact testing machine for metals has been designed and is now being marketed by Testing Machines Inc., 72 Jericho Turnpike, Mineola, New York, USA. It is based on conventional-type models, and can perform standard Izod, Charpy, and tension/impact tests; a new feature, however, is an automatic electric safety clutch brake which stops the pendulum after one complete swing, making the machine safer for the operator to use. Other features are a motorized pendulum control and remote controls.

**Prices reduced**

Leicester, Lovell & Company, Limited, report that with effect from October 1 prices of all liquid and solid "Epophen" epoxide resins were reduced by 1s. per lb. on all quantities. Similar reductions have been made in prices of the firm's non-irritant hardeners, so that the effective cost to the user of resin/hardener systems has been substantially lowered.

**Silicate Binder:** Amongst materials of interest to foundry executives listed in "Development Products"—a six-monthly report on new chemical developments by Crosfields (Joseph Crosfield & Sons, Limited, Warrington, Lancashire)—is Isopropyl Silicate P., a mixture of isopropyl orthosilicate and isopropyl polysilicate, which it is suggested is suitable for use as a binder for investment casting moulds and for other refractories.

## Qualcast Developments

With the objective of familiarizing the public with the activities of the Qualcast group of companies, the Press were invited to inspect not only the Derby plant at Victory Road, but also the Austin Motor Company at Longbridge, Birmingham, to see the sort of contribution which this foundry makes to the automobile industry. This action was desirable as, because of the huge production at Qualcast—some 800,000 lawnmowers each year—the public is largely unaware of the firm's other activities. Altogether Qualcast employs some 5,000 people who made about 53,000,000 castings last year, which allows the group to claim that they are the largest repetition ironfounders in Europe.

The automobile industry takes a substantial portion of the output of Qualcast's foundries and the visitors to Longbridge were shown the machining of the castings, their assembly into engines, and finally, the line-production of the finished cars.

At Derby, the unique ferrous die-casting department was inspected. Initially, in 1941, there were four turntable machines of the Eaton-Erb type. These have now been increased to 12 in number, each carrying 12 dies, and turn out remarkably rapidly over 30,000,000 castings per year. The machines are serviced by a number of runabout stacking trucks. Metal is provided by hot-blast water-cooled cupolas and a second plant of this type is also installed in the new automatic grey-iron foundry. Here, a German automatic moulding plant has been recently installed at a cost of £500,000. It has suffered from "teething troubles" and has not yet reached its potential production of 400 tons per week. In reference to this plant, Mr. J. E. V. Jobson in his address to the shareholders said: "We know the conception is right, but as yet we have not managed to get continuity of operation. We have had to make numerous mechanical adjustments to the machines as originally supplied and are gradually improving them. We have been over a year trying to get this right and now have achieved only 60 per cent. of the contract speed. This has meant, of course, that the plant has operated 'in the red' during the year and as a rough estimate, I should say the year's figures were adversely affected to the tune of £100,000 on this venture. However, I think we can say the end is in sight."

At the time of the visit, the plant was working steadily and producing moulds at a commendable speed. Moreover, some sections of the plant were admirably designed.

In the older section of the plant, where production is by simple moulding machines, the production was excellent, whilst the coreshops for the foundries are well equipped and highly productive. The department where the dies are made—virtually a large-size metal patternshop—is extremely well equipped with modern milling machines and other machine-tools.

## Dallow Lambert's New Research Building

A new building for the research and development section has recently been completed by Dallow Lambert & Company, Limited, Thurmaston, Leicester. Activities of this department are exclusively directed to the improvement of existing designs of the company's dust-control equipment and to the development of new ideas. The section, which is additional to the existing laboratory and demonstration departments, is completely self-contained.

## INCO's President

Early this week, the Mond Nickel Company, Limited, staged a Press Conference at the Savoy Hotel, London, to introduce Mr. J. R. Gordon, the president of the International Nickel Company of Canada, Limited. Dr. J. F. Thompson, honorary chairman of INCO, made the formal presentation and thereafter Mr. Gordon discussed with the Press recent phases of the company's operations. Particularly, he described and illustrated with lantern slides the new INCO development scheme at Thompson, Manitoba, Canada, from the time of the first prospector's hut up to to-day's township; the latter has cost the company $8,500,000 to house 8,000 personnel, needed to serve the extraction plant which has been built. Amongst the data disclosed were the facts that the new Thompson mine is expected to produce 33,500 tons of nickel annually; that the heaviest consumer of nickel is the stainless-steel market which takes 30 per cent. of the gross total and that the foundry industry at 12 per cent. of the production represents no mean outlet.

Following the tradition that the heads of this international enterprise should have a research background, Mr. Gordon is a Canadian who graduated from Queen's University in 1920 with the degree of B.Sc. in chemistry. He joined INCO in 1936 as director of the research department established that year at Copper Cliff, Ontario. He was made an assistant to the vice-president in 1941, technical assistant to the vice-president in 1946, assistant vice-president in 1947 and assistant general manager of Canadian operations in 1952. He succeeded the late R. L. Beattie in June, 1953, as vice-president and general manager of Canadian operations and the same year was elected a director of the company. In January, 1957, Mr. Gordon was elected executive vice-president of the company and president in April, 1960. Mr. Gordon is also a director of various other concerns, including the Babcock & Wilcox Company and Whitehead Metals, Inc. In 1948, he was the recipient of the medal of the Canadian Institute of Mining and Metallurgy and was given an honorary degree of Doctor of Law from Queen's University in 1955. He was awarded the James Douglas Gold Medal of the American Institute of Mining, Metallurgical and Petroleum Engineers in December, 1957, for distinguished work in process metallurgy in smelting and refining nickel.

## British Foundry Installation for Rumania

A £2,000,000 contract for a complete foundry plant has been secured by Consolidated Foundry Plant, Limited, a British consortium which includes the Stone-Platt group, the Incandescent Heat group, Paterson Hughes Engineering Company, Limited, and the Staveley Coal and Iron group. The order is for a combined radiator and bath foundry, machine-shops and enamelling shops. The factory, it is reported, will be the largest and most modern in Rumania and one of the most technically advanced in Europe. Some 2,000 tons of machinery including 3,000 separate items are involved. Final details were recently completed, in London, by Mr. Gheirghiu Nistor, deputy Minister of the Rumanian Ministry of Construction. Final discussions have also taken place on the erection of a large sanitary earthenware factory which is to be constructed on the same site.

# Public Works and Municipal Services Exhibition

*The eighth post-war Public Works and Municipal Services Exhibition is to be held at Olympia, London, from November 14 to 19. Of the 400 groups and individual companies who will be exhibiting this year a considerable number will be from the foundry industry. Some of the stands having a particular interest for founders are briefly described below.*

ROBERT HUDSON, LIMITED (*Stands 26 and 27, Grand Hall*) will exhibit the new hydraulically-operated 7 cu. yd. Leedsall dumper trailer, with a rated capacity of nearly 10 tons.

ATLAS COPCO (GREAT BRITAIN), LIMITED (*Stand No. 78*) will have on show a skid-mounted stationary compressor and a twin twin-screw rotary-compressor, powered by a Rolls-Royce diesel engine.

HOLMAN GROUP OF COMPANIES (*Stands 30 and 31, Grand Hall*) introduce new additions to their Rotair helical-rotor single-stage range of compressors—a lightweight portable model with a free air displacement of 150 cu. ft. per min., and a stationary unit.

STANTON IRONWORKS COMPANY, LIMITED (*Stand No. 29, Grand Hall*). Products displayed on this stand will include a spun-iron pipe of 42-in. i.d. and 18 ft. long; a short pipeline incorporating flanged special castings and flanged spun-iron pipes; and samples of the company's pig-irons and refined irons.

CONSOLIDATED PNEUMATIC TOOL COMPANY, LIMITED (*Stand No. 76, Grand Hall*). A full range of civil-engineering power tools, a new chipping hammer and a new vibrator will be on show. Of particular interest will be model 125 "Power Vane" rotary compressor for mounting on and using the power take-off of a Land Rover.

INGERSOLL-RAND COMPANY, LIMITED (*Stand No. 50, Grand Hall*) will have on view two of the "Gyro-flo" range of portable air compressors, the DRA 125 and the DR 365 which are being shown for the first time. Another new unit to be shown is the company's XLE stationary compressor, giving free air delivery of 700 to 2,000 cu. ft. per min.

NATURAL RUBBER BUREAU (*Stand No. 522, National Hall Gallery*). This company will "highlight" on their stand the key position that natural rubber is assuming in building, engineering and public works. Exhibits will show the use of natural rubber for conveyor belts, anti-vibration mountings, chute linings, pump linings, and rubberized anti-corrosive paints.

BROCKHOUSE ENGINEERING, LIMITED (*Stands 415 and 416, Grand Hall Gallery*) exhibit their new dual-speed light transmission (shown attached to a Perkins Four 99 sectional engine); a one-speed light transmission, a fork-lift-truck type torque converter, industrial-tractor transmission, the light industrial torque converter and the 1150 torque converter.

SMALL & PARKES, LIMITED (*Stand No. 438, Grand Hall Gallery*). Displayed on this stand will be Don brake linings and clutch facings; Sinter-Don sintered metal friction materials, Donflex clutch discs, Karmal engine packings and Don stair-treads. A range of accessories will also be on view, including fan and dynamo belts, air and water hose, asbestos cloth and tapes, transmission belting, webbing, and conveyor belting.

LEWIN ROAD SWEEPERS, LIMITED (a company of the Brockhouse Organization) (*Stand No. 219, National Hall*). A feature of this exhibit will be the "Sweep-master" sweeper/sprinkler/collector having a total sweeping width of 7 ft. Other features of the unit include a rotary paddle-type elevator, a hydraulically-operated tipping body and a water tank capacity of 170 gall. Another exhibit is a mechanical orderly designed to work in confined spaces and suitable for use in industrial plants and factories.

WAKEFIELD-DICK INDUSTRIAL OILS, LIMITED (*Stand No. 535, National Hall Gallery*). The theme of this exhibit will be the complete lubrication service offered by the company to public works contractors, municipal authorities and industry in general. The equipment on show will include a selection of the company's mechanical lubricators and grease pumps and a new item on the stand will be the "SG" grease lubricator which has been designed specifically for the pumping of self-levelling greases.

LEYLAND MOTORS, LIMITED (*Stand No. 121*). Major attraction of this exhibit will be a new version of a dump truck from Scammell Lorries, Limited; also on show from Scammell will be a Scarab 6-cu.-yd. side-loading refuse collector. Leyland exhibits will comprise an EN.250 diesel engine and UE.350 diesel, with 12-in. and 13-in. three element single-stage torque converters respectively; an 0.375 sectioned diesel engine as supplied for earth-moving applications; a PU.680 diesel power pack, and a vertical UE.900 diesel engine for shunting locomotive applications.

E. BOYDELL & COMPANY, LIMITED (*Stands 213 and 221, National Hall*). Several of the company's dumpers and loaders in the current Muir-Hill range will make their debut at Olympia. The loader section will include the RD2 with quarry bucket and Brockhouse transmission and the FD4 with 1 cu. yd. full-width bucket. The dumper section will feature the 3 cu. yd. Muir-Hill 10B hydraulic dumper and the 6 cu. yd. 18B hydraulic quarry dumper. Other exhibits will include the Winget-Muir Hill 15 cwt. 2S model dumper and the 22½ cwt. 3S model with concrete-carrying body.

RANSOMES & RAPIER, LIMITED (*Stand No. 55, Grand Hall*). Amongst machines of new design on show for the first time will be a Rapier 4 cu. yd. hydraulic-drive truck mixer, mounted on an A.E.C. chassis; a 9 cu. yd. hydraulic-drive truck mixer, mounted on a Foden chassis, and a range of self-priming pumps with capacities from 4,000 to 80,000 gall. per hr. The pumps are powered by petrol, diesel or electric motors or may be supplied with bare shafts for independent, belt, chain or gear drives. Photographs and models will illustrate other Rapier concrete mixers and walking draglines.

BROOM & WADE, LIMITED (*Stand No. 28, Grand Hall*). A comprehensive range of air compressors and pneumatic tools will be featured by this company. Amongst the air compressors to be shown are portable, rotary models with output from 85 to 600 cu. ft. per min.; type WR. 600 delivering 600 cu. ft. per min., fitted with a C.6NFL Rolls-Royce diesel engine and automative-type steering; a new and compact plant, type P.D. 52, delivering 40 cu. ft. per min. at 80 lb. per sq. in., and the new "Broomwade" two-stage, double-acting, self-contained motor-driven, stationary air compressor, type V. 500, delivering 525 cu. ft. per min. at 100 lb. per sq. in. and running at 485 rpm.

Other firms not mentioned previously who will be exhibiting compressors, drills, etc., include ARMSTRONG WHITWORTH (PNEUMATIC TOOLS), LIMITED (*Stands 311 and 312, Empire Hall*), who are to show for the first time in this country the new "Thor" air and hydraulic

*Public Works Exhibition*

rock-drill crawler, and CRAELIUS COMPANY, LIMITED (*Stand No. 617, Empire Hall Gallery*) who will have on show a skid-mounted, diesel-powered diamond core drill with a 15-ft. folding mast. A number of firms will be exhibiting pumps and included amongst these are GOODENOUGH PUMPS, LIMITED (*Stand No. 90, Grand Hall*); MONO PUMPS, LIMITED (*Stand No. 635, Empire Hall Gallery*); INDUSTRIAL PUMPS, LIMITED (*Stand No. 541, National Hall Gallery*), and DOWTY HYDRAULIC UNITS, LIMITED.

PRIESTMAN BROS., LIMITED (*Stand Nos. 37 and 60, Grand Hall*) introduce their "Lion 111" excavator/crane—claimed to be the first new, wholly British-designed machine of its size to be produced in the UK for 15 years. At the Exhibition, the "Lion 111" will be exhibited as a lifting crane. Of a different nature is the Liebherr Model 11A/13 saddle jib crane, shown for the first time in this country by TOWER CRANES, LIMITED (*Stand No. 41, Grand Hall*). Erected from the ground and with all sections introduced at the base, this the largest of three sizes of pneumatic-tyred tower cranes made by Liebherr. BRITISH HOIST & CRANE COMPANY, LIMITED (*Stand No. 92, Grand Hall*) have added a new hydraulic mobile crane to their range—the "Iron Fairy" 6, and GEORGE COHEN 600 GROUP (*Stands 326 and 327, Empire Hall*) introduce the 600 Pingon model P.8 tower crane. "Skymaster Mk. II" and "Loadmaster" are two of the featured exhibits of A.C.E. MACHINERY, LIMITED (*Stand No. 98, Grand Hall*), and RUSTON-BUCYRUS, LIMITED (*Stand No. 69, Grand Hall*) are showing their new 11-RB transit machine.

A number of firms will be exhibiting dumpers and these include ROAD MACHINES (DRAYTON), LIMITED (*Stands 20 and 21, Grand Hall*). THWAITES ENGINEERING COMPANY, LIMITED (*Stand No. 81, Grand Hall*), and THOS. W. WARD, LIMITED (*Stand No. 93, Grand Hall*).

Stands devoted to tractors, scrapers, excavators, etc., include EUCLID (GREAT BRITAIN), LIMITED (*Stands 44 and 45, Grand Hall*), J. C. BAMFORD (EXCAVATORS), LIMITED (*Stand No. 90a, Grand Hall*), and JACK OLDING & COMPANY, LIMITED (*Stand No. 232, National Hall*).

## Industrial Training Council

Newly-elected chairman of the Industrial Training Council is Mr. G. H. Lowthian, M.B.E. He succeeds Lord McCorquodale who has been the chairman of the Council since it was set up in July, 1958. Mr. Lowthian is general secretary of the Amalgamated Union of Building Trade Workers and a member of the General Council of the TUC. He was one of the TUC representatives on the sub-committee of the National Joint Advisory Council on Recruitment and Training of Young Workers in Industry (the Carr Committee).

In connection with the training of young workers, the Council is convening a conference of representatives from organizations on both sides of industry to discuss preparations for the training of the "bulge" in school-leavers entering employment next year and the following two years. The conference is to be held in London on November 29, and the Minister of Labour and the Secretary of State for Scotland have accepted invitations to address it.

BIRTALL FOUNDRY COMPANY has received planning permission for an expansion project, which includes modernization of a building formerly used as a dyeworks.

## Industrial Output and Wage Comparisons

Many hold the view that all comparisons are odious, but most will agree that sometimes they are useful, particularly if like is compared with like. Of interest to JOURNAL readers is the following table for values of gross output of various industries in Wales related to employment and wages. It is taken from a paper entitled "Movement of Industry: Local and National Factors," presented by Mr. R. Mathias (regional secretary, Transport & General Workers' Union) at the national conference of the Institute of Management on October 12.

*Comparison of Value of Gross Output: Number of Employees and Wages Paid in Selected Industries in Wales.*

| Industry. | Year. | Value of gross output × £1,000 | Wages and salaries × £1,000 | Average No. of persons Employed. | Wages/salaries as percentage of gross output. | Average wage per week |
|---|---|---|---|---|---|---|
| | | | | | | £ s. d. |
| *Coal Mines* .. | 1948 | 61,030 | 45,149 | 124,093 | 73¾ | 7 0 0 |
| | 1957 | 118,520 | 78,473 | 120,820 | 66¼ | 12 10 0 |
| *Iron and Steel* | | | | | | |
| (*a*) Melting and rolling | 1948 | 65,806 | 10,499 | 25,479 | 16 | 8 0 0 |
| | 1957 | 241,774 | 24,839 | 32,604 | 10¼ | 14 13 0 |
| (*b*) Steel sheets | 1948 | 35,199 | 5,094 | 13,066 | 14½ | 7 10 0 |
| | 1957 | 102,953 | 9,693 | 13,023 | 8½ | 13 14 0 |
| (*c*) Tin-plates | 1948 | 31,595 | 5,414 | 15,445 | 17 | 6 15 0 |
| | 1957 | 90,461 | 7,823 | 11,728 | 8½ | 12 17 0 |
| Non-ferrous metals (smelting and rolling) | 1948 | 22,265 | 4,680 | 12,423 | 21 | 7 5 0 |
| | 1957 | 48,882 | 7,211 | 10,947 | 14¾ | 12 13 0 |
| Iron foundries | 1948 | 3,513 | 1,248 | 3,613 | 35½ | 6 13 0 |
| | 1957 | 8,526 | 2,179 | 3,579 | 25½ | 11 15 0 |
| Mechanical engineering (general) | 1948 | 6,611 | 2,319 | 6,904 | 35 | 6 10 0 |
| | 1957 | 23,764 | 6,825 | 11,503 | 28¾ | 11 10 0 |
| Railway carriage wagons | 1948 | 3,981 | 1,194 | 3,545 | 30 | 6 9 0 |
| | 1957 | 9,139 | 3,046 | 5,186 | 33½ | 11 6 0 |
| Brick and fireclay | 1948 | 3,308 | 1,337 | 4,322 | 40½ | 6 0 0 |
| | 1957 | 6,860 | 2,610 | 4,640 | 38 | 10 16 0 |

*Note.*—The statistics in columns 1, 2 and 3 are taken from the fifth edition of the *Digest of Welsh Statistics*.

## Belgians to Birmingham

By arrangement with the Birmingham branch of the Institute of British Foundrymen, twenty-six Belgian foundrymen will be touring foundries and other establishments in the Midlands area during the three days commencing Wednesday, October 26. Places to be visited include the British Cast Iron Research Association's laboratories at Alvechurch, those of the Mond Nickel Company, Limited, at Wiggin Street, Birmingham, and the foundries of F. H. Lloyd & Company, Limited, at Darlaston, Wm. Mills, Limited, at Wednesbury, and Castings, Limited, and Chamberlin & Hill, Limited, at Walsall. The Birmingham branch is entertaining the party to dinner on the Thursday evening. The visitors will be using direct air travel to and from Elmdon Airport, Birmingham.

A CONGRESS of the *Bureau International de la Récupération* (BIR) is to be held in Brussels on October 27 and 28.

## Personal

Mr. A. McKELLAR has been appointed a director of the North British Locomotive Company, Limited, Glasgow.

Mr. F. STAFFORD, general works manager of Rolls-Royce motor-car division, has been appointed a director of the division.

Mr. ALBERT W. WOOLDRIDGE has resigned from the board of Esso Petroleum Company, Limited, and has retired from the service of the company.

LADY TREFGARNE has been appointed to the board of W. E. Sykes, Limited, manufacturers of gear-cutting and measuring machines, etc., Staines, Middlesex.

Mr. F. TURNER, manager of the locomotive division of John Fowler & Company (Leeds), Limited, engineers, has been appointed a local director of the company.

Mr. W. T. FLOWER has been appointed deputy managing director of Bailey Meters & Controls, Limited, a subsidiary of Babcock & Wilcox, Limited.

Mr. S. SHENTON, secretary, and Mr. G. H. MUTCH, have been elected directors of Daniel Adamson & Company, Limited. Dr. A. R. MORCOM has resigned from the board.

Mr. H. P. BARKER, chairman and managing director of Parkinson Cowan, Limited, was elected chairman of the British Institute of Management at the annual general meeting in London on Wednesday.

Mr. S. C. ELDERS, who held the position of chief draughtsman, at the International Combustion Limited, Derby, has retired after nearly 35 years with the company. Mr. T. H. HOOD is Mr. Elders' successor.

Mr. Q. C. McMILLAN, A.R.C.S.T., F.I.M., Mr. J. A. H. A. NICOL, Mr. A. PEARSON, Mr. T. T. SHEPHERD, B.SC. (ENG.), have been appointed directors of the Clyde Alloy Steel Company, Limited, a subsidiary of Colvilles, Limited.

Mrs. ALICE MAY HALL, welfare supervisor at Stanley Works (Great Britain), Limited, Rutland Road, Sheffield, retired on October 14 after 20 years with the firm. She started in the war as an inspector in the department which made primers for shells.

Mr. GRAHAM RICH, 20-year-old silversmith apprentice, under the Sheffield consultant designer, Mr. David Mellor, took first prize in the senior silversmith section at the International Apprenticeship Competition at Barcelona. He received his prize from General Franco in Madrid.

Mr. C. T. BUSCH (46), chief accountant of the Rover Company, Limited, for the past five years and a director of its five operating subsidiaries, has joined the headquarters staff of the B.S.A. Company, Limited, as group chief accountant. Mr. Busch is a Fellow of the Institute of Chartered Accountants.

Mr. W. E. AYLWIN, director and general works manager, Midland Tar Distillers, Limited, who joined the company in 1932, retired from the post of general works manager on October 13, but has retained his seat on the board. Mr. W. F. DINES has been appointed general works manager.

Following upon the death of Mr. A. E. HOLLINGS, managing director of Dowding & Mills, Limited, Mr. G. A. ONION, has been appointed to the board. He will be director in charge of the Birmingham works. Mr. P. L. HOLLINGS will continue as director controlling the London and Southampton works.

Mr. C. E. HOLMSTROM, chairman of Shepcote Lane Rolling Mills, Limited, Sheffield, and a director of Firth-Vickers Stainless Steels, Limited, Staybrite Works, Sheffield, has retired from the boards of both companies. Mr. J. T. W. DEWAR, managing director of the companies, has succeeded Mr. Holmstrom as chairman of Shepcote Lane Rolling Mills.

Mr. ROY HALL, for the past three years sales director of the Sales Executives Club of New York, has been appointed vice-president in charge of marketing of Leyland Motors (U.S.A.) Inc. He has been connected with the American automobile industry for many years in the capacities of sales manager and sales promotion manager with some of the larger companies.

Mr. K. S. MARTIN is joining the Butterley Company, Limited, of Ripley, Derbyshire, to take up the new appointment of deputy general manager of the engineering departments. Mr. IAN LEES, at present assistant manager of the constructional section of Butterley Ironworks, is to take over the section as manager. Mr. Lees has been with the company for nine years.

The appointment is announced of Mr. RICHARD J. HEWITT as convention and exhibits manager of the American Foundrymen's Society's Castings Congress and Exposition to be held in San Francisco next year from May 8 to 12. Mr. Hewitt has had 25 years' experience in the promotion and management of exhibitions, conventions, etc., and for the past four years has been executive assistant manager and director of trade shows and conventions of the (American) Master Photo Dealers and Finishers Association.

Mr. D. R. S. TURNER, B.A., A.M.I.MECH.E., has been appointed a director and general manager of Davidson & Company, Limited, engineers and ironfounders, Siroco Engineering Works, Belfast. Mr. Turner who gained his early engineering experience with the British Thomson Houston Company, Limited, Rugby, was in charge of the development of the works of Associated Electrical Industries, Limited, at Larne, from 1953 to 1958, and since then he has been commercial manager of the turbine-generator division of AEI at Manchester.

In announcing the new chairman of F. W. Berk & Company, Limited, (JOURNAL, September 22, p. 376), the name of Mr. C. H. Tanner was unfortunately misprinted as Turner. Apologies are offered to all concerned.

## Obituary

The death has occurred, at the age of 72, of Professor PIERRE CHEVENARD, who was well-known internationally as the inventor of an apparatus for differential dilatometry. He was a past-president of the *Association Technique de Fonderie*. In Newcastle, in 1925, he gave a lecture on the occasion of the annual meeting of the Institute of British Foundrymen.

A memorial service for Mr. GEORGE A. WOOD, former manager of the electric melting departments at Sheffield and Openshaw of the English Steel Corporation, Limited, was held at St. John's Church, Abbeydale, Sheffield, on October 10. Mr. Wood died at the age of 70. He had served with the company for 44 years before retiring in 1955. When he was appointed manager of the electric melting department at the River Don works in 1922, the firm's output by this method was 25 tons of castings per week, but at the time of his retirement 3,000 tons per week were being produced. Mr. Wood had travelled widely for the firm concerning technical matters in the making of steel. He was a Fellow of the Institute of Metallurgists.

# Company News

STAVELEY COAL & IRON COMPANY, LIMITED—Final dividend of 8 per cent. makes 11 (10) per cent. for the year ended June 30, 1960. Group profit rose to £1,675,843 (£1,349,881), before tax of £850,875 (£743,077).

ASSOCIATED ENGINEERING, LIMITED—The French manufacturers of cylinder liners and pistons, Société E. Demolin, has been bought for 480,000 ordinary 5s. units and £140,108 cash. It is stated that negotiations are well advanced for the acquisition by Société E. Demolin of another piston manufacturing company in Paris.

VICKERS-ARMSTRONGS (ENGINEERS), LIMITED—All the issued capital of Metchair, Limited, office and factory seating manufacturers, of Hemel Hempstead, has been purchased. Mr. R. Wonfor, sales director of the company, has been appointed chairman of Metchair and Mr. W. E. Hoyle, who founded that company in 1945, continues as a director.

CONCENTRIC MANUFACTURING COMPANY, LIMITED—Reconstruction, involving the setting up of a holding company, is planned. As a first step, two new operating companies have been formed, Concentric (Engineering), Limited, and Concentric (Non-Ferrous), Limited, to take over the respective sections of the business. In each case, the initial capital is £100.

DANIEL ADAMSON & COMPANY, LIMITED, boilermakers and steam-turbine manufacturers, etc., of Dunkinfield (Ches)—Reduced orders and keen prices made trading conditions in 1960 begin badly, as Mr. R. W. Parkyn, the chairman had forecast. In the first six months the company incurred a loss, but the directors feel justified on the prospects in recommending the usual 3 per cent. interim dividend.

GLOVER & MAIN, LIMITED—Terms of the rights issue forecast in August have been announced. A total of 1,202,814 new ordinary shares of 10s. each at 10s. 6d. a share are to be offered to ordinary shareholders on October 10, on the basis of one new share for every three held. The directors expect payment of a final dividend for the current year on the increased capital of 9d. a share (less income tax).

H. W. LINDOP & SONS, LIMITED, malleable iron-founders, of Walsall—Final dividend of 18½ per cent. makes, as forecast, a total of 25 (23) per cent. for the year ended June 30, 1960, on a capital increased by an issue against an acquisition. The new shares issued in connection with the recent one-for-two rights issue do not rank for the final dividend. Group net profit rose to £30,589 from £17,445, after tax of £30,980 (£19,017).

SILENTBLOC, LIMITED, manufacturers of anti-vibration devices, of Crawley (Sussex)—Another rights issue is to be made to provide for increased factory space and additional plant and machinery. Two new 2s. shares at 3s. each will be offered for every seven held. This will raise the issued capital to £495,000. It is proposed to double the authorized capital to £1,000,000, but there are no plans for issuing the new capital, states Mr. B. H. Dulanty, the chairman.

WILLIAM DOXFORD & SONS, LIMITED, shipbuilders and engineers, of Sunderland—Final dividend of 25 per cent. is declared, making a total of 30 per cent. for the year ended June 30, 1960, as before. Group profits amounted to £1,248,318, compared with £1,217,005, and the net profit is little changed at £660,318 (£667,005). As a year ago, there is a 1 per cent. participating dividend on the 5 per cent. preference stock, making a 6 per cent. total.

SERCK, LIMITED, makers of radiators, oil coolers, non-ferrous tubes, etc., of Birmingham—A final dividend of 7½ per cent. makes 12 per cent. for the year ended July 30, 1960, on capital increased by a one-for-two scrip issue. The previous year's equivalent was 11¼ per cent., with a special distribution equal to 1½d. per 5s. ordinary. Group profits declined by £200,847 to £1,073,038. The year was notable for increased turnover, reduced profit margins, and heavy development expenditure.

CEMENTATION COMPANY, LIMITED—No ordinary dividend is recommended for the year ended March 31, 1960. Last year a 12½ per cent. dividend was paid. Net trading profit fell from £1,144,649 to £425,800, after tax of £349,467 (£654,511), and the directors justify the passing of the dividend by the fact that the results to date for the current year show no improvement. They add that while many of the company's activities continue to prosper, these may be offset by losses elsewhere and continuing costs which cannot be immediately adjusted.

SMITH & WELLSTOOD, LIMITED, manufacturers of stoves and catering equipment, of Bonnybridge (Stirling)—Encouraged by the growth of the commercial catering business since the acquisition of Gardiner & Gulland, Limited, the board continues to be alive to the need for diversification. The new subsidiary, states Mr. R. W. Fovargue, the chairman, made a satisfactory contribution to the group net profit which, in the year ended June 30, 1960, was £80,996 (£69,310). The dividend is raised by 2 per cent. to 12½ per cent. and orders on hand continue to grow.

## Wickman to acquire Coventry Machine Tool

Formal offer has been made by Wickman, Limited, machine-tool makers, of Coventry, a subsidiary of John Brown & Company, Limited, for the whole of the issued capital of the Coventry Machine Tool Works, Limited. The offer is 18s. 6d. for each of the 750,000 4s. shares and continues the recent policy of John Brown to broaden the basis of its activities by extensions and the acquisition of compatible businesses.

The directors of Coventry Machine Tool recommend shareholders to accept the offer which they intend to accept in respect of their own holdings. The company has its main works at Halifax and also owns freehold works at Birmingham.

## John Thompson forms Refrigeration Division

Refrigeration division is to be formed by John Thompson, Limited, manufacturers of boilers, nuclear and chemical plant, etc., of Wolverhampton. Based on Wolverhampton, the division will develop the refrigeration work carried out for several years by the South African subsidiary.

The new division will concentrate on refrigeration projects for the chemical and oil industries and for food storage and refrigerated transport.

The company also announced last week its intention to enter the domestic-appliance field. An agreement has been concluded with the Tappan Company, of Mansfield, Ohio, US, to produce electric-cooking units at Wolverhampton.

*Coming . . .*

# NO-BAKE BINDERS

• NO BAKING WHATSOEVER • NO HEATING OF BOXES
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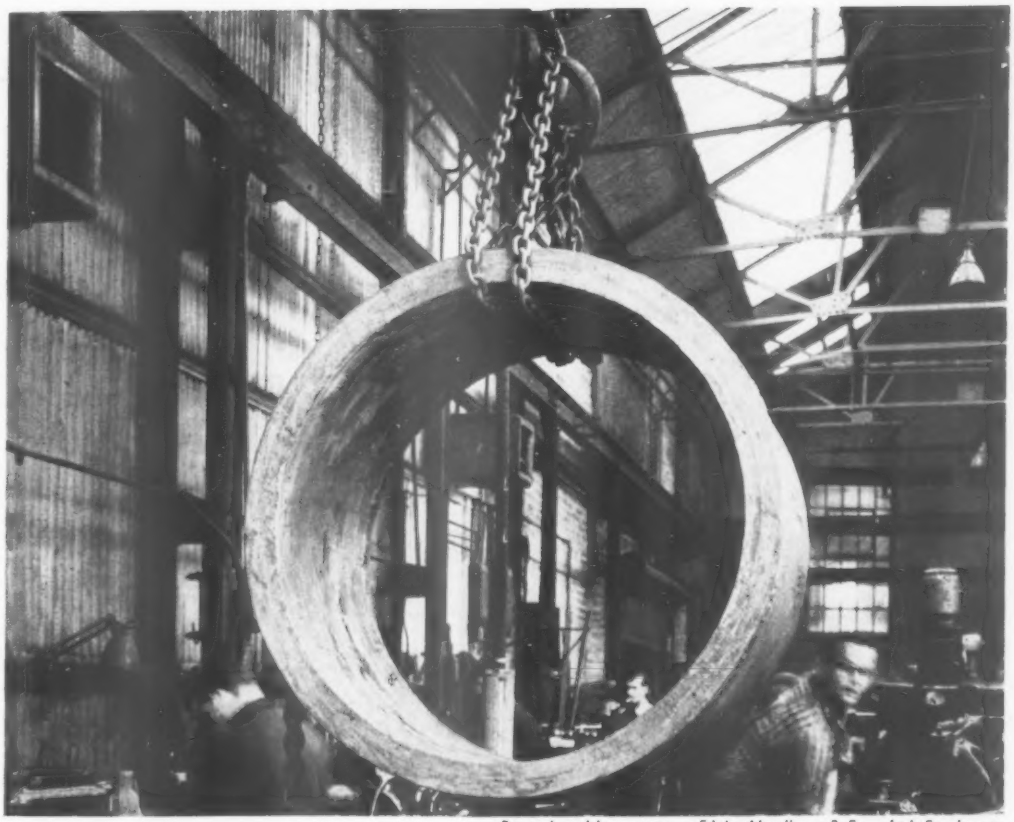

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WEIGHT OF CASTING. 9 CWT. 2 QRS. 12 LB.
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# News in Brief

TELEPHONE NUMBER of Leicester, Lovell & Company, Limited, North Baddesley, Southampton, has been changed to Rownhams 2131 (10 lines).

HUGHES TOOL COMPANY, LIMITED, Texas oil-well drill-bits manufacturers, plan to establish a forging plant at their works at Castlereagh, Belfast.

THE SEVENTH ANNUAL CONFERENCE of the Institution of Industrial Safety Officers is to be held at the Majestic Hotel, Lytham St. Annes, from October 28 to 30.

THOUSANDS OF SHOOLCHILDREN who are approaching school-leaving age are expected to visit a careers convention which is to be held at the Edmund Road Drill Hall, Sheffield, on October 28 and 29.

HEMEL HEMPSTEAD ENGINEERING COMPANY, LIMITED, Cupid Green Foundry, Hemel Hempstead, Herts, have formed a wholly-owned subsidiary company, Suxe Combustion, Limited, to concentrate on the manufacture, sale and technical development of the Suxe solid-fuel burner.

THOS. W. WARD, LIMITED, Tinsley, Sheffield, who have been engaged on breaking up the last of Sheffield Corporation's trams have now started removing the wires along 22 miles of disused tram track in Sheffield. During the work the firm expects to remove about 24 tons of copper.

ERNEST FAIRBAIRN, LIMITED, have appointed McDowell & Company (Engineers), Limited, 75, The Grove, Marton, Middlesbrough, as their agents for north-eastern England, for selling moulding machines and other foundry plant produced by their principals, Kuenkel, Wagner & Company.

MEMBERSHIP OF THE Lorry Mounted Crane Association more than doubled in September with the admission of 17 further companies. The association is at present studying the Ministry of Transport's proposals to amend current regulations concerning the operation of heavy motor vehicles on the highway.

A RECENT EXPORT SHIPMENT of multiple tools from the Desoutter Factory at Hendon included seven units for Czechoslovakia. Each year, since 1946, over half the output of Desoutter tools has gone overseas and export orders for the first nine months of 1960 have already exceeded last year's figures.

S.A.P.I.M.A. (PTY.), LIMITED, 6, Bloomsbury Square, Holborn, the London office of a South African concern manufacturing *inter alia* ceramic filters for use in foundrywork, announce that they are seeking a distributor for this production in this country: they will themselves handle overseas inquiries.

RECENT CONTRACTS received by Plenty & Son, Limited, of Newbury, include oil-firing pumps for the heating systems at the new head offices of the Shell International Petroleum Company, Limited, on the South Bank of the Thames, and at Bucklersbury House, one of the largest office blocks in London.

THE STRONG ROOM at the offices of International Combustion, Limited, Derby, was blown open by gelignite thieves shortly before midnight on October 4. They got away with £29,500 wages money. There were 500 men at work on night duty and it is a mystery how the thieves passed the security guards.

AS MILLED PEAT is now a raw material for the foundry industry, laboratory staffs will find interest in an article on the sampling of this material for moisture content by Mr. J. P. Murray. It appears in the October issue of the *Journal* of the Institute of Fuel, published from 18, Devonshire Street, London, W.1.

ALBERT JACKSON (DOMESTIC EQUIPMENT), LIMITED, has been registered with £5,000 capital to carry on the business of manufacturers of and dealers in gas, electric, kitchen and domestic equipment and furniture. Directors are:—Mr. Albert Jackson and Mr. John H. Jackson, junr. The registered office is at 40, Barber Road, Sheffield 10.

ENGLISH STEEL CORPORATION, LIMITED, which employs 14,500 men at its Sheffield, Manchester and Darlington works, has produced a pension scheme for male workpeople enabling them to contract out of the State scheme; the staff of 3,000 are not included. Staff contributory pension and life assurance schemes are being reviewed.

MARCO CONVEYOR & ENGINEERING COMPANY, LIMITED, of Leytonstone, have been awarded a contract in excess of £100,000 for the design, supply and erection of a log-handling plant in the groundwood mill at Steti, near Prague, Czechoslovakia. This follows on earlier orders for a big foundry plant for Yugoslavia and a log-handling plant for Portugal, both of which contracts are nearing completion.

SAMUEL OSBORN AND COMPANY, LIMITED, have acquired the Parkhouse works of Wilford and Company, Limited, to which is being transferred all warehousing from the company's Wicker Works, Sheffield. Almost 100 staff and workpeople will be moved to the new warehouses and a great deal of equipment used in final despatch. The firm will continue to use the open site beside the approach to the Sheffield Victoria station.

THE BOARD OF TRADE in consultation with the Ministry of Power announce that they are prepared to consider applications for licences to export ferrous and non-ferrous scrap arising from ships of 100 gross tons or over to be broken up in the United Kingdom. Intending applicants should apply for further details to the Ministry of Power, Iron and Steel Division, Room 1464, Thames House South, Millbank, London, S.W.1.

ARDEX SURFACES, LIMITED, of 88, Crawford Street, London, W.1, has been formed to market floor-screeding compounds manufactured by Ardex Chemie G.m.b.H. of Western Germany. Mr. Percy Harris is chairman; the other directors being Dr. Ing. K. Krafft, Mr. R. H. Guerin and Mr. J. Warren-Price, F.C.I.S. It is intended that, in due course, these products will be manufactured by Lafarge Aluminous Cement Company, Limited, at their West Thurrock Works.

C. & J. HAMPTON, LIMITED, toolmakers, Sheffield, held an open day at their three works on Saturday, October 8, for the first time in their 62 years' existence. The employees, of whom there are 850, had themselves asked for the opportunity to show their work places to their families and friends. At the works in Ouse Road, Darnall, there was an exhibition of the firm's products and each departmental manager provided a smaller exhibition of the work in his own section.

SHEFFIELD HAS RECORDED one of the lowest unemployment percentages ever recorded—a total unemployed of 1,692, making a percentage of 0.6. Vacancies totalled 2,221—an increase of 307 in a quarter. The number of unemployed had fallen by 382 in a period of three months. Mr. Robert Downham, the Employment Committee secretary told the quarterly meeting on October 11. Of the city's insured population only 25 were affected by short-time working. The unemployment percentage of 0.6 compared with

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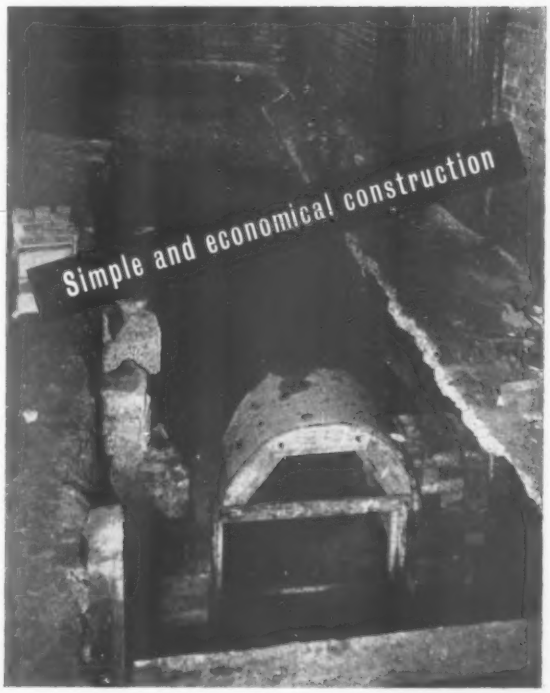


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AP73

*News in Brief*

the regional figure of 1 per cent., and the national figure of 1.3 per cent.

HIS ROYAL HIGHNESS PRINCE HARALD, 23-year-old Crown Prince of Norway, is to open a new £2,500,000 sinter plant at Workington Iron and Steel Company, a branch of United Steel Companies, Limited, on December 6. The existing plant at Workington has been in operation since 1943. Norwegian iron ore is particularly suitable for the acid Bessemer steelmaking process employed at Workington, and is supplied in the form of a finely-powdered concentrate. Some 150,000 tons of these concentrates are used each year by the company, and this will be increased to 400,000 tons when the new plant is in operation.

GIBBON BROTHERS, LIMITED, Dudley, are the contractors responsible for design and construction of an oil-fired tunnel kiln to be installed at the Loxley works of Thomas Wragg & Sons (Sheffield), Limited, makers of casting-pit refractories. The kiln, which will be over 30-ft. long, is a main item in a £275,000 scheme for an additional production unit. Construction has commenced on a site adjoining the main works. Most of the clay preparation plant is being supplied by Bradley & Craven, Limited, of Wakefield; the main contractors for the complete project, which includes a unit of single-storey construction designed to reduce handling to a minimum between processes, are George Longden & Son, Limited, and the consultant engineers are Husband & Company, Limited, both of Sheffield.

WITH ASSISTANCE from the Soviet Union and Czechoslovakia, two heavy electrical projects are to be set up in India during the third Five-year Plan. Both projects are expected to go into production within the next three years. The Indo-Soviet project will produce 750,000 kw. hydro- and thermal-generating units and high-power motors for the steelworks, whilst the other, with Czechoslovakian collaboration, will manufacture thermal units of 600,000 kw. capacity and about 19,000 tons of high-pressure boilers. Final arrangements are now being made in Prague and Moscow by a three-man official delegation from India consisting of Mr. K. B. Mathur, chairman of Heavy Electricals; Mr. M. Hayath, chairman of the Central Water and Power Commission, and Mr. B. D. Kalekar, senior industrial adviser to the Government of India. On November 1, Prime Minister Nehru is to inaugurate the Heavy Electrical Plant, a State-owned undertaking now under construction near Bhopal.

MEMBERS of the Birmingham, Wolverhampton, and Dudley Chambers of Commerce attended the luncheon meeting, on October 11, of the Walsall Chamber at which Sir Edward Boyle, Financial Secretary to the Treasury spoke. Warning against indifference over exporting, he said "Very often one meets individual small businessmen who say exporting is difficult for them and it is easier to sell on the home market. The answer to that is that unless we export enough, the Government will simply be bound to keep on with restrictive measures and take economic steps to keep down the level of imports." Success in the world export market, he added, was a matter of co-operative effort between the Government and all sides of industry. The Government had to ensure that export trade was not being impaired by "too soft conditions of the home economy." On the problem of labour Sir Edward said, "I only hope wage earners will collectively come to realize that they are going to be the chief sufferers if exports are handicapped by labour troubles."

## Hanover Fair, 1961

At a Press reception held at the Connaught Rooms, London, on October 10, under the patronage of His Excellency, the German Ambassador, Herr Hans Von Herwarth, details were given of the Fifteenth Industries Fair to be held in Hanover from April 30 to May 9, 1961. A documentary film entitled "Hannover Fair" was shown and this was introduced by Herr Dr. Max W. Clauss, director of Foreign Services of the Deutsche Messe-und Austellungs AG. Since the Fair was first held in 1947, it has been necessary to increase the exhibition area every year to accommodate the growing number of German and foreign exhibitors. Foreign exhibits are a very important feature of the Fair and their number has materially increased over the last few years, having doubled in four years to 836 firms out of about 4,800 exhibitors in 1960. Despite such an increase in participation from abroad, many firms are still on the waiting list and some of these will be able to exhibit in 1961. In 1960, French firms led with 177 exhibitors, followed by Great Britain and the United States with 96 and 91 respectively. The 1959 Fair was visited by buyers from 93 countries, whilst visitors from 103 nations attended in 1960. Amongst other British stands at the 1961 Fair, it is understood that the Morgan Crucible Company, Limited, will be showing for the first time. The UK agents for the Fair are Schenkers, Limited, Royal London House, 13, Finsbury Square, London, E.C.2.

## Dartmouth Auto Castings announce Expansion Plans

Dartmouth Auto Castings, Limited, of Smethwick, is largely dependent on the automobile industry, but despite the present difficulties in this section of the foundry industry, intends to go ahead with its £500,000 extension plan. The scheme is for two new production buildings, a patternshop, maintenance shop and furnace equipment, and work on the new project is to commence at the end of this month. A spokesman of the company said that they had every confidence in the future development of the motor industry and hence had no intention of going back on their plans. The scheme, when completed, will increase both efficiency and output it is stated. The new buildings on land used previously for storage purposes will mean an extra 30,000 sq. ft. of factory space.

## New Industrial Rehabilitation Unit

Mr. John Hare, Minister of Labour, will formally open the new Industrial Rehabilitation Unit at Walmgate Road, Perivale, Greenford, Middlesex, to-day (Thursday) at 3.30 p.m. Set up as a result of a recommendation in the Piercy Report on the Rehabilitation of Disabled Persons, the unit is already handling its first intake of rehabilitees. It is housed in buildings attached to the existing Government Training Centre and is equipped to accommodate 100 men, women and young persons; it serves an area covering 22 employment exchanges in the north-west of London. Accommodation comprises administrative offices, reception hall, remedial gymnasium, industrial records section, extensive workshops, a cinema and education section.

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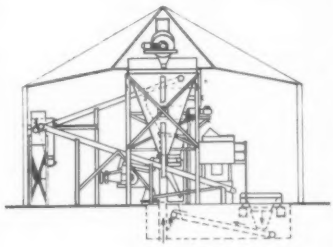

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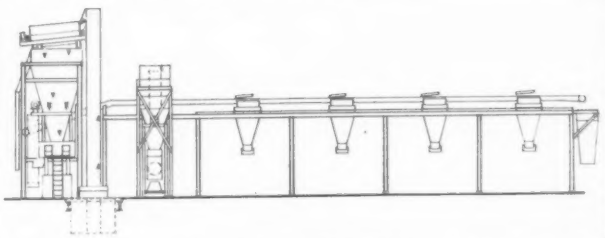
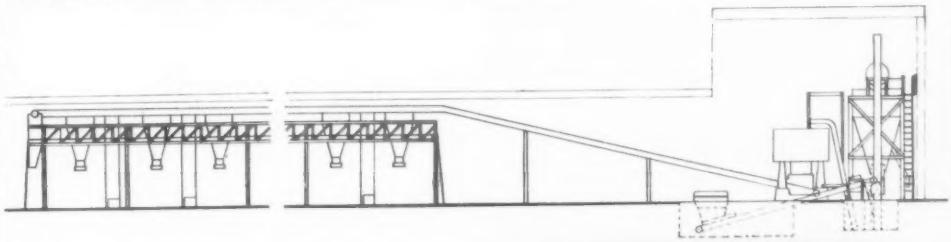




**FOUNDRY PLANT BY Richards**

Richards Structural Steel Co. Ltd., Phoenix Iron Works, Leicester 61237

# Raw Material Markets

## Iron and Steel

Production of pig-iron continues at satisfactory levels and adequate supplies of raw materials are available at the furnaces to enable them to obtain the different grades of iron required. The steelworks continue to absorb the major portion of these outputs in basic pig-iron, while substantial quantities of hematite are also used in the production of ingot moulds for them.

All the foundry grades of pig-iron including hematite, low and high phosphorus irons, together with the refined irons, are available in adequate quantities, and makers generally would be able to increase on present deliveries if required to do so. The easy supply position does not warrant the foundries carrying stocks apart from the tonnages required to ensure uninterrupted production and on this account there is little forward buying.

The low phosphorus irons continue comparatively in heaviest demand, but the pressure for supplies is not now so great on account of the reduced requirements of the engineering foundries which cater for the motor-car industry. Up to the present, demands from these foundries for pig-iron have not fallen to any appreciable extent, but in the event of further cuts being made in delivery schedules, lower outputs of castings would result.

The heavy engineering and electrical trades, machine-tool makers, steelworks, and other consumers are specifying freely for high duty castings and their demands enable the foundries supplying them to obtain good outputs which need large quantities of low phosphorus irons and hematite. The light foundries chiefly engaged on castings for the building trades continue to receive good support, but those supplying the domestic utensil trade are very short of work and production is well below capacity levels. In some instances there is short-time working.

There are plentiful supplies of high phosphorus irons, the furnaces having tonnages to spare in stock and from current production. Some of the excess tonnage is shipped overseas, but here exporters are up against keen competition from makers abroad.

The re-rollers continue well occupied and are obtaining maximum outputs consistent with the shortage of suitable labour. They have good order-books for all their products and demands for small bars and light sections are maintained at recent levels, reinforcing bars being in heavy request. Apart from carbon and alloy steels, most of the re-rollers have plentiful supplies of steel semis. Fairly good stocks of mild steel billets are held by them and home steelworks continue to send forward the tonnages at present called for.

## Non-ferrous Metals

The outlook for copper in London continues bearish. This, in spite of the cut-backs in production by the Rhodesian producers, the strike at Chuquicamata, and the hold-up of supplies through the dock tally clerk strike, reflects the adequacy of supplies available *vis-à-vis* current demand. The US position is much the same or worse. Following the reduction in the price of custom smelter copper by 2 cents to 31 cents a pound, two of the American "big three" producers reduced their quotation by the same amount and the other producer is expected to follow suit.

More than that, Phelps Dodge has announced that it had been working at only 94 per cent. of capacity and that they were now going to cut back to 90 per cent. This news had no effect on the market as it only served to underline the position of oversupply and also raised the suspicion that other producers had cut their capacity without saying so.

At present the US price for both custom smelters and producers is 31 cents a pound and as such is equivalent to £248 a ton. Thus there is no temptation for US producers to offer surplus metal in this country. However, the feeling is crystallizing that the custom smelters will again reduce their price which, in turn, will reduce the producers' quotation. If that happens the UK market could sink well below £220 a ton.

Tin is a good market in London and New York where the price is fractionally below $1.04 cents a pound, but hesitant in Singapore where the quotation has been steadily declining. In London the tally clerk strike has affected the market position and has thrown the weight of demand on nearby metal. That it is in somewhat short supply is reflected by the widening backwardation which is now out around £12-£13 a ton. No amelioration of this situation is in sight. The outlook remains good and, with consumption in general terms remaining at a high level, a shortage of metal and higher prices can well be the result in the market before this year is out.

Lead is still a dull market in London and the price for cash metal no better than £66 a ton. Fears of further arrivals of foreign metal to add to the available stocks has led to a firmly established contango. In the US the market is also without feature although the quotation for spot metal, New York, is unchanged at 12 cents a pound.

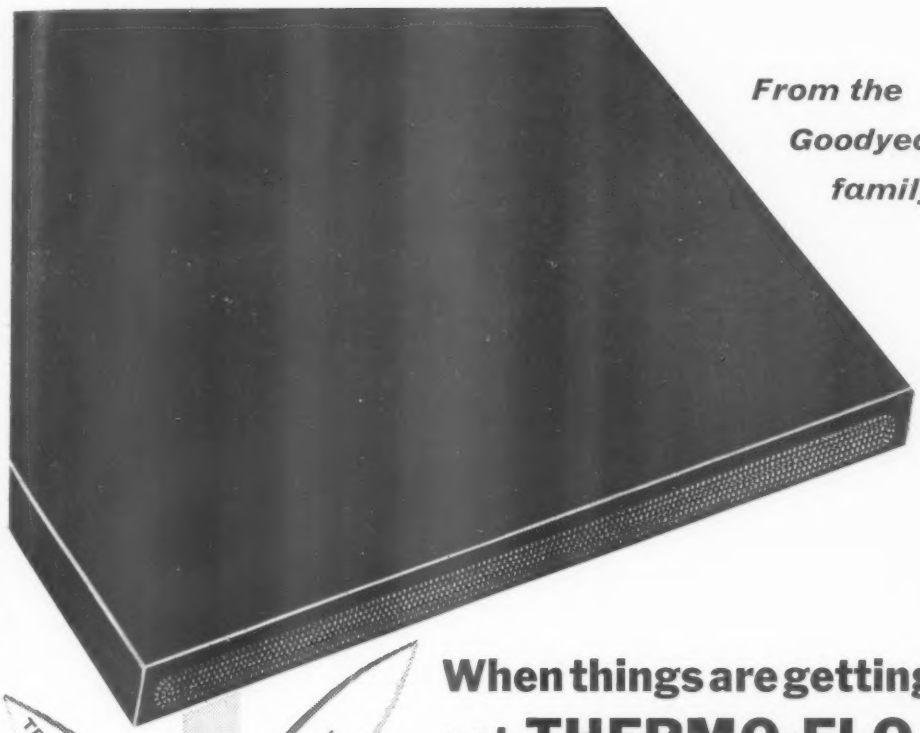
Zinc is an erratic market in London although the overall tendency is towards weakness. This has been accentuated by the short-time working and redundancy in the car industry and the outlook suggests a further fall in the quotation. In the US much the same position holds with the market being affected by the below-capacity working of both the steel and automotive industries. At present the spot price, East St. Louis, is unchanged at 13 cents a pound.

## AFS Regional Conferences

Several regional conferences have been scheduled by the American Foundrymen's Society as follow: The Purdue Cast Metals Conference will be held at Purdue University, Lafayette, Indiana, on October 27 and 28; on November 3 and 4, the Michigan Regional Conference will take place at the Bancroft Hotel, Saginaw, Michigan, and two regional conferences are scheduled for February, 1961. These are the Wisconsin Regional Foundry Conference at the Hotel Schroeder, Milwaukee, on February 9 and 10, and the South-eastern Regional Foundry Conference at Read House, Chattanooga, Tennessee. Ten technical sessions are scheduled for the Purdue Conference, two each being devoted to iron, steel and non-ferrous metals respectively, in addition to sessions on solidification of metals, quality control, shell core process and preventive maintenance. Topics to be discussed at the Michigan Conference include permanent moulding, magnesium die-casting, ductile iron, cores, automatic foundry systems, shell and $CO_2$ processes, casting design, etc.

HAWKER SIDDELEY BRUSH TURBINES, LIMITED—Mr. C. H. Sparks has been appointed to the board in an advisory capacity.

HARLAND ENGINEERING COMPANY, LIMITED—Mr. T. H. Thorneycroft, a director, has been elected to succeed the late Mr. H. Cowan-Douglas as chairman.



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# Current Prices of Iron, Steel, and Non-ferrous Metals

*(Delivered unless otherwise stated)*

October 19, 1960

## PIG-IRON

**Foundry Iron.**—No. 3 IRON, CLASS 2, 10-ton lots or over: Middlesbrough, £21 6s. 0d.; Birmingham, £20 18s. 3d.

**Low-phosphorus Iron.**—Over 0.10 to 0.40 per cent. P, 10-ton lots or over, £23 5s. 0d., delivered Birmingham, £23 10s. 0d., delivered Grangemouth.

**Cylinder and Refined Irons.**—North Zone, £25 6s. 6d.; South Zone, £25 9s. 0d.

**Refined Malleable.**—P, 0.10 per cent. max.; North Zone, £26 6d. 6d.; South Zone, £26 9s. 0d.

**Hematite.**—Si up to 2 per cent., S. & P. over 0.03 to 0.05 per cent., 10-ton lots or over; N.-E. of England (local iron), £23 19s. 0d.; Scotland (Scotch iron), Zone S.1, £24 5s. 6d.; Sheffield, £25 7s. 6d.; Birmingham, £25 14s. 0d.; Wales (Welsh iron), £23 19s. 0d.

**Basic Pig-iron.**—£20 3s. 0d., delivered Staffs, Derbyshire, Notts, Lincs, Rutland, Northants, and Leicestershire in 10-ton lots or over.

## FERRO-ALLOYS

*(per ton unless otherwise stated, delivered)*

**Ferro-Silicon** (6-ton lots and over).—45 per cent. Si, £43 10s. 0d. to £46 0s. 0d., scale 15s. 0d. per unit, lumpy; 75 per cent. Si, £59 0s. 0d. to £63 10s. 0d., scale 15s. 0d. per unit, lumpy.

**Ferro-vanadium.**—50/60 per cent., 20s. 6d. per lb. of V.

**Ferro-molybdenum.**—65/70 per cent., carbon-free, 12s. 10d. per lb. of Mo.

**Ferro-titanium.**—20/25 per cent., 2-3 per cent. Cu, £250 0s. 0d.; 38/40 per cent., commercially carbon-free, £287 0s. 0d.

**Ferro-tungsten.**—80/85 per cent., 11s. 6d. per lb. of W.

**Tungsten Metal Powder.**—98/99 per cent., 14s. 6d. per lb. of W.

**Ferro-chrome** (6-ton lots and over, lumpy).—4/6 per cent. C, £81 10s. 0d. to £84 10s. 0d., basis 60 per cent. Cr. scale 27s. 0d. to 28s. 6d. per unit; over 6 per cent. C, £79 0s. 0d. to £82 10s. 0d., basis 60 per cent. Cr, scale, 27s. 0d. to 28s. 6d. per unit; 2 per cent. C,* 1s. 8d. to 1s. 11d. per lb. Cr; 1 per cent. C,* 1s. 8d. to 1s. 11½d. per lb. Cr; 0.15 per cent. C,* 1s. 9½d. to 2s. 0½d. per lb. Cr; 0.10 per cent. C,* 1s. 9¾d. to 2s. 0¾d. per lb. Cr; 0.06 per cent. C,* 1s. 11d. to 2s. 1d. per lb. Cr.

**Metallic Chromium.**—98/99 per cent., 6s. 10d. per lb.

**Metallic Manganese.**—94/96 per cent., carbon-free, £275 0s. 0d.; 96/98 per cent., £285 0s. 0d.

**Ferro-columbium.**—65/67 per cent., Cb + Ta, 19s. 9d. per lb., Cb + Ta.

**Ferro-manganese** (Standard).—78 per cent., £61 10s. 0d.

## SEMI-FINISHED STEEL

**Re-rolling Billets, Blooms, and Slabs.**—BASIC: Soft u.t., 100 tons & over, £31 15s. 6d.; tested, 0.08 to 0.33 per cent. C, 6 to 35 tons, £33 15s. 6d.; hard (0.41 to 0.60 per cent. C), under 10 tons, £34 17s. 0d.; silico-manganese, under 10 tons, £43 16s. 6d.; free-cutting, under 10 tons, £36 14s. 6d. SIEMENS MARTIN ACID (under 10 tons): Up to 0.25 per cent. C, £41 1s. 0d.; silico-manganese, £44 4s. 0d.

**Billets, Blooms, and Slabs for Forging and for Stamping** under 10 tons).—BASIC: soft, up to 0.33 per cent. C, £38 10s. 0d.; basic, hard, over 0.41 up to 0.60 per cent. C £39 12s. 6d.; acid, up to 0.25 per cent. C, £43 4s. 0d.

## FINISHED STEEL

**Heavy Plates and Sections (1 ton to 10 tons).**—Ship plate (N.-E. Coast), £41 12s. 0d.; boiler plates (N.-E. Coast), £44 2s. 0d.; floor plates (N.-E. Coast), £43 10s. 0d.; angles (N.-E. Coast), £38 16s. 6d.; joists (N.-E. Coast), £38 12s. 6d.

**Small Bars, Sheets, etc.**—Rounds and squares, under 3 in., and flats 5 in. wide and under, untested soft basic, 50 tons and over, £39 1s. 0d.; under 10 tons to 4 tons, £40 18s. 0d.; under 4 tons to 2 tons, £41 3s. 0d.; hoop and strip, coils, 100 tons and over, £38 0s. 0d.; uncoated strip mill coils, hot rolled, under 3 mm. to 12g., 25 tons to under 50 tons, £43 16s. 0d.; black sheets (hand mill), 24g., 10 tons and over, £57 14s. 6d.; galvanized corrugated sheets, 24g., 10 tons and over, £68 5s. 0d.

**Alloy Steel Bars.**—1 in. dia. and up: Nickel, £67 17s. 0d.; nickel-chrome, £98 11s. 0d.; nickel-chrome-molybdenum, £111 4s. 0d., in lots of 5 tons to under 10 tons.

## NON-FERROUS METALS

**Copper.**—Cash, £219 15s. 0d. to £220 0s. 0d.; three months, £221 10s. 0d. to £222 0s. 0d.; settlement, £220 0s. 0d.

**Copper, Tubes, etc.**—Solid-drawn tubes, 2s. 2¼d. per lb.; rods, 247s. 6d. per cwt. basis; 20 s.w.g., 281s. 6d. per cwt.

**Tin.**—Cash, £804 0s. 0d. to £804 10s. 0d.; three months, £794 10s. 0d. to £795 0s. 0d.; settlement, £804 10s. 0d.

**Lead (Refined Pig).**—Second half October, £66 5s. 0d. to £66 15s. 0d.; second half January, £68 0s. 0d. to £68 5s. 0d.

**Zinc.**—Second half October, £86 10s. 0d. to £86 12s. 6d.; second half January, £85 7s. 6d. to £85 12s. 6d.

**Zinc Sheets, etc.**—Sheets, 15g. and thicker, all English destinations, £123 5s. 0d.; rolled zinc (boiler plates), all English destinations, £121 10s. 0d.; zinc oxide (Red Seal), d/d buyers' premises, £102 10s. 0d.

**Brass Tubes, etc.**—Solid-drawn tubes, 1s. 10d. per lb.; sheets to 10 w.g., 199s. 3d. per cwt.; wire, 2s. 8d.; rolled metal, 199s. 3d. per cwt.

**Brass (Brazing).**—BS1400, B3, £167; B6, £220.

**Brass (High Tensile).**—BS1400, HTB1, £191; HTB2 £210; HTB3, £225.

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**Phosphor Bronze.**—BS1400, PB1 (AID released), £304; BS1400, 90/10/1, £289.

**Leaded Phosphor Bronze.**—BS1400, LPB1, £231.

**Phosphor Bronze Strip, etc.**—Strip, 285s. 6d. per cwt.; wire, 4s. 0¾d. per lb.; rods, 3s. 3¼d.; tubes, 3s. 3¼d.; chill cast bars, solids 3s. 3d.; cored 3s. 4d (CHARLES CLIFFORD, LIMITED).

**Nickel Silver, etc.**—Rolled metal, 3 in. to 9 in. wide × 0.056, 3s. 10d. per lb.; round wire, 10g. in coils (10 per cent.), 4s. 3d.; special quality turning rod, 10 per cent., ½ in. dia., in straight lengths, 4s. 2d. All prices are net.

**Other Metals.**—Magnesium, ingots, 2s. 2¼d. to 2s. 3d. per lb.; Antimony, English, 99 per cent., £200 0s. 0d. Quicksilver, ex-warehouse, £70 10s. 0d. Nickel, £600 0s. 0d. Aluminium, ingots, £186 0s. 0d.; aluminium bronze (BS1400), AB1, £242, AB2, £251.

* Average 68-70 per cent.

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# New Patents

*(Copies of complete specifications are obtainable from the Patent Office, Sales Branch, 25, Southampton Buildings, Chancery Lane, London, W.C.2, price 3s. 6d.)*

**817,048.** Ford Motor Company, Limited, 88 Regent Street, London, W.1.

A process for the production of cored machine parts which are free from many of the limitations imposed upon machine designers by the inherent properties of sand-based moulding materials. The invention is especially adapted to the production of aluminium parts for internal-combustion engines, into which parts cast-iron or steel-cylinder barrels are incorporated during manufacture.

**817,370.** Nobel Bozel, 67 Boulevard Haussmann, Paris, France.

The use of a colour-changing indicator to ascertain whether the treatment of a mass of sand and silicate by a gas (such as $CO_2$) has been sufficient to impart the desired degree of hardness.

Suitable types of indicator, which react according to the formation of silica gel, are those with a pH between 8 and 10. Examples are thymol blue, paraxylenol blue, thymolphthalein, phenolphthalein, orthocresol phthalein, and paraxylenolphthalein. According to one technique, phenophthalein is dissolved, without stirring in sodium silicate in the proportion of 0.5 gm. per kg. of silicate. The red solution obtained is mixed with siliceous moulding sand at the rate of 5 per cent. by weight of silicate to sand. A mould is then constructed. Carbon dioxide is injected into this mould until the red colour disappears. The mould thus produced is claimed to exhibit excellent cohesion and hardness, when tested.

**817,414.** National Research Corporation, 70 Memorial Drive, Cambridge, 42, Mass., USA.

Arc-melting furnaces used in the production of castings of titanium and other highly reactive metals.

**817,499/500.** American Cast Iron Pipe Company, Birmingham, Alabama, USA.

Mechanisms for forming refractory linings in vented metal-moulds used in centrifugal casting of tubular metal articles. (See also B.P. 717,515 for reference.)

**817,543.** Regie Nationale des Usines Renault, 8/10 Avenue Emile Zola, Billancourt (Seine), France.

Pressure-die-casting machines. A low- or medium-pressure fluid is used for opening and closing the mould, and for operating a high-pressure pump which delivers fluid at high pressure to an accumulator which supplies the necessary pressure for the injection of the mouldable material into the mould.

**817,646.** Mond Nickel Company Limited, Thames House, Millbank, London, S.W.1.

This Patent is concerned with the lining of moulds with a flexible sleeve of fibrous glass, or similar material, which is backed by a refractory of high-melting point (such as an oxide silicate or aluminate) and which fuses at least partially when the molten metal comes into contact with it. Zircon is claimed to be a very suitable backing material. Others are magnesia, alumina, kaolin or china clay, sillimanite, topaz, ganister, magnesite, olivine, chromite and zirconia.

**817,661.** Imperial Chemical Industries, Limited, Imperial Chemical House, Millbank, London, S.W.1.

Apparatus for preparing foundry moulds which are subjected to a hardening process, before being removed from the pattern. This apparatus consists of a plate for supporting the pattern and a moulding box. This plate has suitable spaces or channels within it on the parts in its upper surface which communicate with it, for passing fluid reagent into the mould. A lifting unit is also claimed, for raising the hardened mould off the pattern. The apparatus is also claimed for use in the $CO_2$ Process.

**817,847.** S. A. Metallurgique D'Esperance-Longdoz, 1 Rue Amand Stouls, Liège, Belgium.

The casting of metals by centrifugal and continuous means, in which the centrifugal force is used to aid the purification of the molten metal, and to help to drive back the solidified metal towards the periphery.

**817,869.** Oglebay Norton Company, Hanna Building, Cleveland, Ohio, USA.

A method of applying a veneer lining upon the inner wall of hot tops. The method is stated to save manpower and time required to apply the veneer, plus the ability to produce, it is claimed, an accurately-sized cavity of fixed dimensions within the hot top to eliminate unnecessary molten metal from being poured into it.

**817,961.** Regie Nationale des Usines Renault, 8/10 Avenue Emile Zola, Billancourt (Seine), France, and Société des Hauts-Fourneaux et Forges D'Allevard, 12 Rue de la Rochefoucauld, Paris (Seine), France.

Moulding apparatus, the principal object of which is to obviate the wear caused by permanent cores.

**818,165.** Regie Nationale des Usines Renault, 8/10 Avenue Emile Zola, Billancourt (Seine), France.

The centrifugal casting of cylinder liners. The invention specifically refers to an improved semi- automatic machine for casting, by the centrifugal method, the cylinder liners of engines. The inventors aim at reducing the number of staff required and the amount of heavy continuous labour they have to do.

**818,258.** Deutsche Gold-und-Silber Schiedeanstalt Vormals Roessler, 9 Weissfrauenstrasse, Frankfurt (Main), Germany.

Process for the manufacture of an encased fuel element for nuclear reactors.

**818,381.** R. L. Olson, 5439 S. Mozart, Chicago, Ill., USA.

Improvements in the sealing of cavitated assemblies. The Patent is particularly concerned with a method and means for sealing opposed mating surfaces of core-boxes, pressure moulds, blow plates and mating flasks or moulds, or other enclosures where an effective seal against internal or external pressure is needed. B.P. **818,382** refers especially to the sealing of such assemblies against internal pressures.

**818,817.** Henry Wiggin and Company, Limited, Thames House, Millbank, London, S.W.1.

Improvements in the manufacture of composite metal parts. A cladding metal is cast into an ingot mould which is then allowed to stand for long enough for a layer to solidify around the whole of the wall of the mould. The molten metal within the layer is then poured out, thus leaving the mould lined by a layer of the cladding metal. While the surface of this layer is still plastic a core metal is cast into the mould to fill the cavity. The resulting ingot is then shaped to fit an extrusion container and worked as necessary.

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Mr. R. S. BRUCE, of G. & J. Hall, Limited, toolmakers, Hereford Street, Sheffield, and president this year of the Sheffield Chamber of Commerce, has been elected a Fellow of the Institute of Works Managers.

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AP91

## Publications Received

**Bulletin No. 3 (Revised).** Issued by J. W. Jackman & Company, Limited, Vulcan Works, Blackfriars Road, Manchester, 3.

This *Bulletin* covers automatically-operated core-blowers, moulding machines and foundry systems. It is devoid of undue showmanship, but is written with authority and great knowledge of modern manufacturing conditions, and would seem to be of great assistance to foundry executives who are desirous of expanding production economically. The descriptions of the machines are clear and the tabular matter incorporated is useful in making a choice of equipment to meet set requirements. A quite new moulding machine is described and illustrated. It is the Osborn automatic blow/fill hydraulic squeeze machine known as the series "M" model. Squeeze moulds have usually been confined in the past to the making of fairly shallow castings, but through the use of the blow/fill, it is claimed that there is but little difference —a mere five points—in the hardness of the rammed sand when tested all over the surface of a mould. The description shows a layout for a complete plant, including automatic mould- and box-handling equipment. The *Bulletin* runs to 24 pages and is clearly illustrated with both line drawings and illustrations.

**Le Prix d'Honneur du Comité International des Associations Techniques de Fonderie,** by Cav. Gr. Cr. Mario Olivo—a limited edition for private distribution.

In three languages, Italian, French and English, this booklet tells why Commendatore Olivo chose the statue of Perseus for the series of Awards of Honour presented by the International Committee of Foundry Technical Associations. The statue ranks amongst the world's greatest masterpieces, but the one now permanently the property of the Committee is a replica of a prototype submitted for approval by Benvenuto Cellini to the Grand Duke Cosimo de Medici. It differs in detail from the finished work of art, when—in the reviewer's opinion—some of the rigid rules of classic art were slightly modified to bring about enhanced beauty of line. The recipients of the award were presented with a miniature of the actual statue as erected in Florence. This beautifully-presented brochure includes the rules governing its award, the biographies of the recipients and finally, the author, in a paragraph, acknowledges the help he received in launching the scheme from his friends, including the late Mr. Tom Makemson and Mr. Vincent Delport.

**Exporting is Profitable**. Issued by the National Union of Manufacturers, 6, Holborn Viaduct, London, E.C.1.

Many of the hints set out in this 20-page booklet are not superficially apparent. For instance, it is stated that export orders are often placed when the home trade is slack. The cost of employing an experienced export merchant, covering a £10,000 a year turnover, is less than that of employing a shipping clerk. The booklet wastes neither space nor time in explaining the function of the Board of Trade credit department, the packing, shipping, insurance and all the paraphernalia of carrying out overseas business, but contents itself by stating that all these problems can be profitably discussed with a special department —the Export Assistance Department—set up by the NUM immediately after the second world war. The usefulness of this department is shown by the printing of a number of testimonials. The booklet is well worth reading by all foundry owners.

**Standard Classifications and Segregation Schedule for Aluminium and Aluminium-alloy Scrap.** Issued jointly by Association of Light Alloy Refiners and Smelters, 3, Albemarle Street, London, W.1, and the National Association of Non-Ferrous Scrap Metal Merchants, Africa House, Kingsway, London, W.C.2.

This publication enables those founders either buying or selling aluminium scrap to "speak the same language" as the merchants, but what is more important is that it enables the former so to segregate their scrap—and ensure trade economies—so that it enters into a recognized grading. Zoological and botanical code-words are assigned to each class of scrap and in the case of the more-important categories, a specification is given. It is an extremely useful publication to have available in light-alloy foundries.

**Annual Report 1959-60 of the Council of Scientific and Industrial Research**, National Metallurgical Laboratory, Jamshedpur, India.

This organization is doing important work using pilot plant for the assessment of the value of a low-shaft ore-reduction furnace for iron. It is of 15-ton-per-day capacity and was set up in January, 1959, and has produced over 1,000 tons of foundry grade pig-iron. The Report acknowledges the help received from the UK in the form of equipment, and its contents cover the usual sections dealing with technical aid to industries; publications, Patents and kindred subjects, and carries two appendices detailing papers published and reports prepared.

**University College of Swansea: Development Appeal.** Issued from Singleton Park, Swansea.

This beautifully-produced brochure is devoted to an appeal for funds to extend the work of the College. It is proposed to double the size of the College within the next decade, and although large sums of money for building and equipment has been sanctioned by the Treasury, the College itself is expected to make a substantial contribution. Some £200,000 has already been received towards this contribution from industry, commerce, etc., but much more is needed to achieve the target of £500,000.

## House Organs

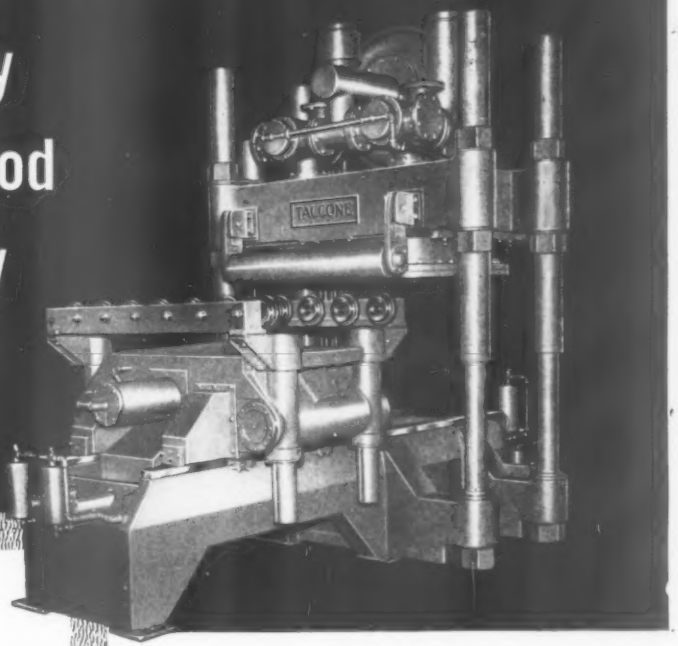
**Wiggin Nickel Alloys, No. 58.** Issued by Henry Wiggin & Company, Limited, Thames House, Millbank, London, S.W.1.

Under the title "Some Experiences in Producing Nimocast Alloys," a description is given in this issue of developments in the foundries of D. Napier & Son, Limited. Materials for missiles are dealt with and further articles detail the use of Monel nickel/copper alloy for the construction of bellows-type expansion joints in pipelines; Nilo controlled-expansion alloys; Wilco-Wiggin thermometals in thermostats for the control of electric heating, and the use of chains in Monel metal for pickling plant.

**EFCO Journal, Vol. 1, No. 4.** Published by the Electric Resistance Furnace Company, Limited, Netherby, 161, Queen's Road, Weybridge, Surrey.

In this issue, an excellent illustration is given of a large-scale carburizing plant at the Darnall works of Davy & United Engineering Company, Limited. The plant, which handles components up to 36-in. dia. by 72-in. long, and 5 tons weight, includes carburizing furnaces, quench tanks, atmosphere generators and control instruments.

# An entirely NEW method of Foundry Moulding

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# 'TACCONE' HIGH PRESSURE DIAPHRAGM MOULDING MACHINE

The 'Taccone' machine makes precision green sand pressure moulding available to every foundry. It ensures sound, accurate castings and the moulds it produces are superior to those made by conventional equipment. 'Taccone' moulds are consistently hard and uniform throughout and can be effortlessly produced by unskilled labour.

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The dimensional accuracy and finish on the castings is comparable with work produced by shell moulding techniques.

The 'Taccone' is more than a machine, more than a process—it is a revolutionary system for rapid mould production.

Ten standard machines are available in the manufacturing range and special machines can be built to any size for any purpose.

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**Advertisements (accompanied by a remittance) and replies to Box Numbers should be addressed to the Advertisement Manager, Foundry Trade Journal, John Adam House, 17/19, John Adam Street, Adelphi, London, W.C.2. If received by first post Monday advertisements can normally be accommodated in the following Thursday's issue.**

## SITUATIONS WANTED

SENIOR FOUNDRY FOREMAN/SUPERINTENDENT, 41, seeks change preferably in Scotland or North England. Wide experience in blackheart malleable, grey, aluminium. Practical experience all aspects of the trade, moulding, core-making, $CO_2$, sand control, fettling, metal control. Box SF888, FOUNDRY TRADE JOURNAL.

GENERAL MANAGER, 20 years' experience in iron foundry management, estimating, costing and labour control. Customer relationship and sales, can negotiate at highest levels. Has also practical knowledge of all foundry practices. Box GM885, FOUNDRY TRADE JOURNAL.

FOUNDRY METALLURGIST/TECHNICIAN (30), L.I.M., A.M.I.B.F., H.N.C., N.F.C. Diploma, experienced high duty irons, steel and light alloys, desires progressive position in modern foundry. Management preferred. Salary £1,200 p.a. Location West Midlands. Box FM877, FOUNDRY TRADE JOURNAL.

FOUNDRY MANAGER, aged 34, married, seeks new post West Midlands or South England. Experienced in Grey Iron repetition, and jobbing up to 3 cwts. Used to working on own initiative, controlling output, purchases, sales and staff. Please reply to Box FM881, FOUNDRY TRADE JOURNAL.

## SITUATIONS VACANT

### CYLINDER BLOCK FOREMAN

C. & B. SMITH, LIMITED, of Wolverhampton, wish to make the above appointment.

Applications are invited from men with good experience of all aspects of cylinder block production. Applicants must already have held a supervisory position connected with moulding and assembly of motor cylinders and should be not less than 30 years of age.

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SALES REPRESENTATIVE for Core Oils required by Foundry Division of large Industrial Oil Manufacturers. He must possess reliable contacts with Foundry Management grades which now reflect in his excellent sales record for this material. This job is ready-made for a real go-getter who knows his facts and the trade intimately and has good reason to believe he can influence existing business for core oils into a new channel. His sales effort will be backed by adequate trade press advertising, literature and demonstration facilities, with every opportunity and encouragement to personally follow through introductions, enquiries and casual contacts. Car provided and generous expenses allowed. Residence in the Midlands is desirable but not essential. Write in confidence, giving the fullest details, with actual dates, turnover figures and other supporting proof of sales ability to SALES MANAGER, Box SR867, FOUNDRY TRADE JOURNAL.

## SITUATIONS VACANT—*contd.*

STEEL FOUNDRY METHODS ENGINEER required for fully mechanised foundry. Applications are invited from experienced men to fill a permanent staff position. Write, stating age, experience and salary required, to: JOHN FOWLER & Co. (LEEDS), LTD., Sprotborough Foundry, Doncaster.

## SITUATIONS VACANT—*contd.*

FOUNDRY Manager wants STAND IN and right hand man with Foundry and Engineering experience for small Iron-founders and Engineers. 30 miles London, producing jobbing light and medium iron castings. Please state experience, age and salary required. Box FM890, FOUNDRY TRADE JOURNAL.

**MSL** *have been retained to advise on the appointment of a*

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*In no circumstances will a candidate's identity be disclosed to our client unless he gives permission after a confidential interview at which he will be given full details of the appointment.*

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For a modern jobbing foundry producing 50 tons of grey iron castings per month.

Successful applicant must possess a practical foundry background.

Age not a primary consideration, but preferably 40/45 years.

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## SITUATIONS VACANT—*contd.*

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ASSISTANT TO FOUNDRY MANAGER required for modern Foundry producing 150 tons of castings per month. In addition to practical foundry experience in the production of iron and non-ferrous castings, applicants must possess some technical qualifications and ability to control labour. The position offers considerable scope for advancement and for inclusion in the Company's non-contributory Pension Scheme. Application should be made in writing to the SECRETARY, Thomas Broadbent & Sons, Limited, Central Ironworks, Huddersfield, stating age, qualifications, experience and salary required.

FOUNDRY FOREMAN required for modern jobbing foundry situated in Gloucestershire producing medium size grey and high duty iron engineering castings up to 2 tons in green sand and $CO_2$. Excellent prospects for the right man but only first class foundryman capable of directing all operations on the shop floor should apply stating age, experience, and salary required to Box FF869, FOUNDRY TRADE JOURNAL.

HAND MOULDERS and CORE-MAKERS required for small jobbing foundry. Experience of non-ferrous metals essential. Good wages and conditions. Apply PERSONNEL DEPT., E.M.I. Ltd., Blyth Road, Hayes, Middx.

**ALUMINIUM CASTINGS AGENCY**

MIDLAND FIRM of Aluminium Founders producing Sand, Gravity and Pressure Die Castings require AGENT to represent them in Scotland. Applicant with existing contacts preferred. Apply Box AC884, FOUNDRY TRADE JOURNAL.

A young, energetic, Foundryman is required as JUNIOR FOREMAN in a South of England Iron Foundry. A good basic training is essential and there are excellent prospects for the right man. Apply Box AY887, FOUNDRY TRADE JOURNAL.

AN experienced ESTIMATOR, aged 35/45, is required for a Mechanised Grey Iron Foundry in the Midlands. Applications are invited from persons who have the ability to estimate from drawings. Commencing salary £950 per year. Carries Superannuation. Apply Box AE878, FOUNDRY TRADE JOURNAL.

**GROUP OF FOUNDRY PLANT MANUFACTURERS requires**

**TECHNICAL DIRECTOR TO SUPERVISE CONTRACTS**

Main requirement: all-round practical experience and responsibility in foundry production (preferably large production of light and medium grey iron castings) and in mechanised foundry planning. Substantial salary offered to the right man. Replies will be treated in strict confidence.

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## SITUATIONS VACANT—*contd.*

FOUNDRY MANAGER required by old established Engineering Firm in East Anglia; pleasantly situated in small country town within a few miles of the sea. The successful applicant will be required to take control of the Iron Foundry and to be responsible for estimating, fixing piece work prices, quality of metal and production. Please apply in writing, quoting age, experience and salary required, to the ASSISTANT GENERAL MANAGER, Box FM886, FOUNDRY TRADE JOURNAL.

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ONE or two Cupolas, each three to four tons per hour capacity, complete with spark arrestors, also electric skip charger, 10 cwts. charge. State price and if plant can be seen working.

**JAMES EVANS & CO., LTD.,**
**Foundry Engineers**
**GP..O. Box No. 391, Manchester.**

"BRECO" or similar 3 phase, 50 cycles, voltage Regulator suitable for use on 400/440 volts supply. 80/100 kVA. WHITEFIELD MACHINERY & PLANT, LIMITED, 48, Chatham Street, Edgeley Hill, Stockport.

CUPOLA, 4 ton per hour, drop bottom, complete with blower, charging machine, wet type spark arrester. Secondhand preferred. Box CU873, FOUNDRY TRADE JOURNAL.

WANTED.—32/33 in. diameter Cupola to give interior diameter of 23/24 in. when bricked, complete with blower, etc. Box DC882, FOUNDRY TRADE JOURNAL.

WANTED.—Mould Drying Stove Door, 8 ft. 6 in. square. State price and delivery. BAYTON FOUNDRY, Bayton Road, Exhall, Coventry.

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ONE Pug Mill required with two fixed solid type Crusher Rollers, Revolving Pan and Adjustable Scrapers. Pan diameter approximately 6 feet, with or without drive. Price and details: Box OP889, FOUNDRY TRADE JOURNAL.

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Portable Electric Sieve.

Four British Moulding Machines, A.T.4

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15 TON overhead travelling crane, 35 ft. span, 2 girder, all electric.
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3-ton foundry ladle.
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30-CWT. cap. MONOMETER Oil-fired Rotary Furnace complete with Burners, Blowers, Control Panel, Recuperator, Exhaust Box and Chimney. Very little used. Can be seen erected.

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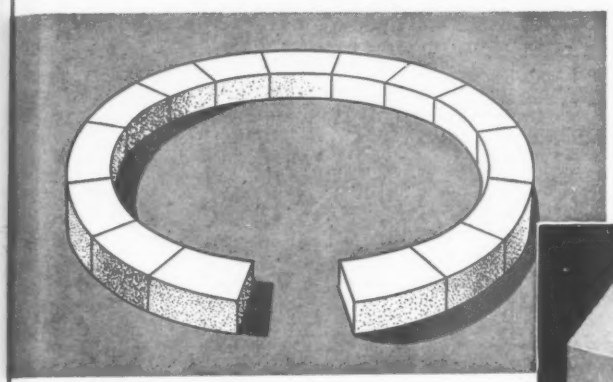

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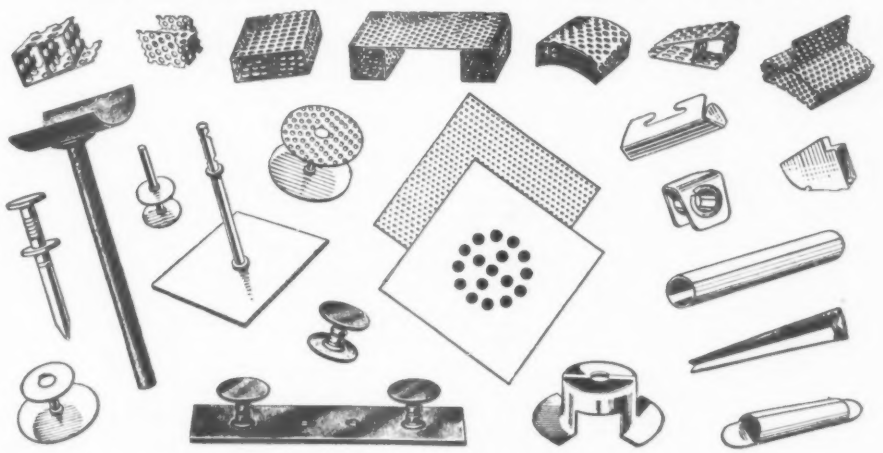

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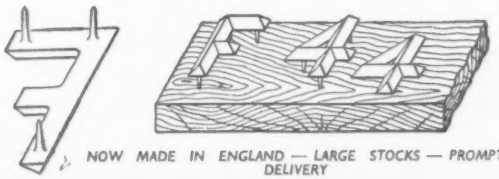

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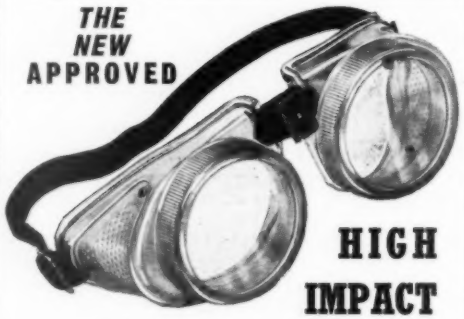

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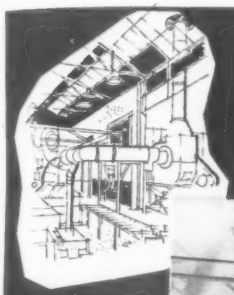

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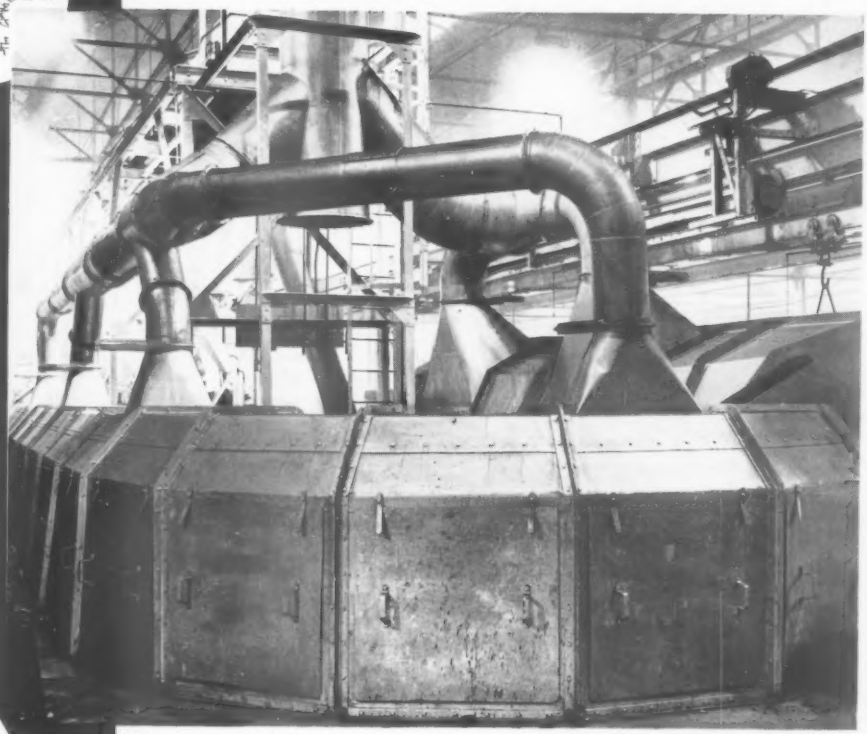

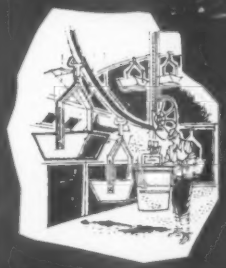

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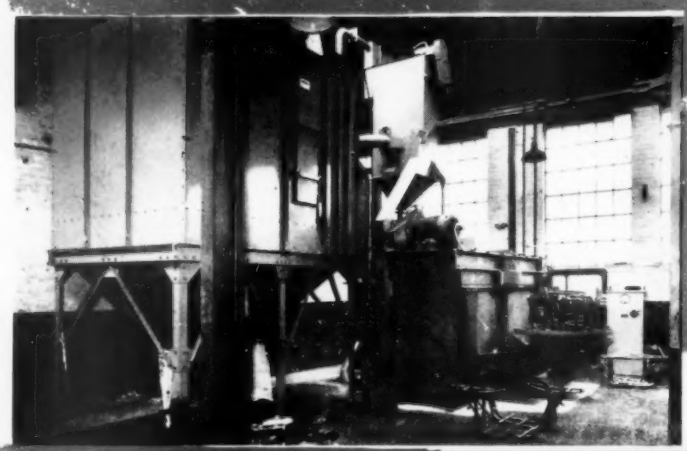

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